2018 -2019- ODD SEMESTER

INTERNAL ASSESSMENT QUESTION

PAPERS

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	23.07.2018/ AN	Marks	50
Course code	EC8353	Course Title	Electron Devices And Circuits			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/ Section	III	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is barrier potential?	C205.1	U
2	Differentiate avalanche and zener breakdown.	C205.1	AZ
3	What are the applications of a Laser diode?	C205.1	R
4	What is transition capacitance and diffusion capacitance?	C205.1	R
5	List the advantages of full bridge rectifier.	C205.1	U
6	Define ripple factor.	C205.1	R
7	A transistor has a typical β of 100. If the collector current is 10 mA, what is the value of emitter current?	C205.2	E
8	Define Early effect.	C205.2	U
9	What is biasing?	C205.2	R
10	Write any two points of comparison between JFET with BJT.	C205.2	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain the reverse characteristics of zener diode?	C205.1	U
11 b	Explain how zener diode can be acts as a voltage regulator.	C205.1	U&AZ
	Or		
12	Draw the circuit diagram and explain the working of full wave bridge rectifier and derive the expression of average output current and ripple factor	C205.1	R &U
13	Explain the construction and operation of NPN transistor with neat sketch. Also comment on the characteristics of NPN transistor.	C205.2	R&U
	Or		
14 a	Explain the construction of n-channel JFET.	C205.2	R&U
14 b	Explain drain and transfer characteristics of JFET.	C205.2	R&U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	With neat sketch, explain the construction, operation and its characteristics of PN junction diode. Also list its advantages, disadvantages and its applications.	C205.1	R &U
	Or		
16	With neat sketch, explain the construction, operation and its characteristics of LED and Laser diodes. Also list its advantages, disadvantages and its applications.	C205.1	R &U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Course handling faculties

Dr. S. Thamizharasan Asso.Prof/ EEE

Venugopal R AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/Session	25.07.18/FN	Marks	50
Course code	EE8301	Course Title	ELECTRICAL MACHINES -I			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What will happen to the speed of a DC motor when its flux approaches zero?	204.6	R
2	Mention the effects of differential compounding and cumulatively compound on the performance of DC Compound motor.	204.6	U
3	What is Critical resistance of DC Generator?	204.5	R
4	What is mean by residual emf in DC Generator?	204.5	R
5	Specify the role of Interpoles in DC machines.	204.5	U
6	What is the purpose of Yoke in a DC machine?	204.5	R
7	Compare Lap and Wave windings.	204.6	E
8	Why DC series motor is called as variable speed motor?	204.6	E
9	Why fractional pitched winding is required than full pitched winding.	204.6	R
10	State the applications of DC Generator.	204.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the armature reaction in DC Generator with its remedies.	204.5	U
	or		
12	Describe the process and methods of improving commutation in a DC machine.	204.5	U
13	Explain the constructional and working principle of DC machine with its necessary emf equations.	204.6	U
	or		
14	Explain in detail about the characteristics of DC motor with neat diagram.	204.6	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	In 400 volts, DC compound generator, the resistance of the armature, series and shunt windings are 0.10 ohm, 0.05 ohm and 100 ohms respectively. The machines supplies power to 20 Nos, resistive heaters, each rated 500 watts, 400 Volts. Calculate the induced emf and armature currents when the generator is connected in (1) Short Shunt (2) Long Shunt. Allow brush contact drop of 2 V per brush.	204.5	AZ
	or		
16	A Separately Excited generator when running at 1000 rpm supplied 200A at 125V.What will be the load current when the speed drops to 800 rpm, if If is unchanged ? Given that Ra =0.04ohms and brush drop=2V.	204.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: P.Pushpa,AP/EEE & R.Vijay, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	24.07.2018/ FN	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Convert $(475.25)_8$ to its decimal equivalent & $(549.B4)_{16}$ to its binary equivalent	C201.1	E
2	What is an unit distance code? Give an example.	C201.1	R
3	State Demorgan's theorem.	C201.1	R
4	Convert the following binary to gray code:1010111000_2.	C201.1	E
5	Perform (11011-100101) using 2's complement.		E
6	Write down the truth table of full subtractor.	C201.2	A
7	Write the POS representation of the following: f(x,y,z)=∑m(0,1,3,5,7).	C201.2	U,A
8	Draw the logical diagram for EX-OR gate using NAND gates.	C201.2	U,A
9	Simplify the expression Z= $AB + A\overline{B}.(\overline{\overline{A}.\overline{C}})$.	C201.2	U,A
10	Convert the given expression in canonical SOP form Y=AC+AB+BC.	C201.2	U,A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Perform the following addition using BCD and Excess-3 addition (205+569).	C201.1	E
11 b	Encode the binary word 1011 into seven bit parity hamming code.	C201.1	E
	or		
12	A 12 bit Hamming code word is read from memory. What was the original 8 bit data word that was written into memory if the 12 bit word read out is as (1)101110010100 (2)111111110100	C201.1	E
13	Design a 4 bit excess 3 code to BCD converter and implement using logical gates.	C201.2	U,A
	or		
14 a	Reduce the following function using K-map. f(A,B,C,D)=ΠM(0,2,3,8,9,12,13,15)	C201.2	A
14 b	Simplify the following function using Karnaugh map. f(w,x,y,z)=∑m(0,1,3,9,10,12,13,14)+∑d(2,5,6,11)	C201.2	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Implement the switching function F=∑(0,1,3,4,12,14,15) using an 8 input multiplexer and write its application(8+2)	C201.2	AZ
	or		
16	Implement a full adder using half adders and MUX.(7+3)	C201.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff Incharge: V.Ajitha /AP/EEE & Dr.S. Vijayalakshmi / Asso. Prof / EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – I			Date/Session	24-07-2018 /AN	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2018 – 2019	
Year	II	Semester/Section	III/ A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Divergence theorem	C203.1	R
2	State Stokes theorem	C203.1	R
3	State the condition for vector A to be a) solenoidal b) irrotational	C203.1	R
4	Point P & Q are located at point (0,2,4) and (-3,1,5). Calculate the distance vector from P to Q	C203.1	A
5	Write the formula for transformation of vector from Cartesian to Cylindrical	C203.1	R
6	Mention the source and effects of electromagnetics.	C203.1	R
7	Define Coulomb's Law	C203.2	U
8	Define Electric field intensity and give its unit.	C203.2	U
9	Define Gauss's Law	C203.2	U
10	Find the force in Newton on charge Q_1 = 20 μC situated at (0, 1, 2) m due to charge Q_2 = 300 μC situated at (2, 0, 0) m.	C203.2	A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	If $\vec{G} = 10e^{-2z}(\rho\vec{a_\rho} + \vec{a_z})$, Determine the flux of $\vec{G}$ out of the entire surface of the cylinder $\rho = 1, 0 \le z \le 1$. Confirm the result by using divergence theorem.	C203.1	AZ
	Or		
12	Express vector $\vec{B} = \frac{10}{r}\vec{a_r} + r\cos\theta\,\vec{a_\theta} + \vec{a_{\Phi\Phi}}$ in Cartesian and Cylindrical coordinates. Find $\vec{B}(-3,4,0)$ and $\vec{B}\left(5,\frac{\pi}{2},-2\right)$	C203.1	AZ
13	Derive an expression for Electric Field Intensity at a point due to finite and an infinite conductor of wire.	C203.2	U
	Or		
14	A Circular ring of radius 'a' carries a uniform charge ρ_L C/m placed on the xy- plane with axis the same as the z axis. a)Show that $\vec{E}(0,0.h) = \frac{\rho_L ah}{2\varepsilon_0[h^2+a^2]^{3/2}}\vec{a_z}$ b) What value of h gives the maximum value of $\vec{E}$ c)If the total charge on the ring is Q, find $\vec{E}$ as a →0	C203.2	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Determine the divergence and curl of these vector fields. a) $\vec{A} = yz\,\vec{a_x} + 4xy\,\vec{a_y} + y\,\vec{a_z}$at (1,-2,3); b) $\vec{B} = \rho z sin\Phi\,\vec{a_\rho} + 3\rho z^2 cos\Phi\,\vec{a_\Phi}$ at (5,π/2,1) ; c) $\vec{C} = 2r\cos\theta cos\Phi\,\vec{a_r} + r^{1/2}\vec{a_\Phi}$ at (1,π/6, π/3)	C203.1	AZ
	Or		
16	Verify divergence theorem, where $\vec{A} = 2xy\vec{a_x} + y^2\vec{a_y} + 4yz\vec{a_z}$ and S is the surface of the cube bounded by x = -1, x = 1, y = -1, y = 1, z = 0, z = 1.	C203.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

***Name of the faculty**: N.Gayathri & P. Magdelin Jennifer Princy*

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/ Session	25.07.2018/ AN	Marks	50
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/ Section	III/A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is the main purpose of the dam?	C303.4	U
2	List any four advantages and disadvantages of hydro power.	C303.4	AZ
3	List the factors to be considered for the selection of site for hydro power plant.	C303.4	U
4	What is meant by water hammer?	C303.4	R
5	What is the principle of GEO THERMAL power generation?	C303.4	U
6	Mention the factors which determine the power in wind.	C303.4	R
7	What are the important properties that a moderator should possess?	C303.3	U
8	Define-Nuclear fission.	C303.3	R
9	What do you mean by mass defect?	C303.3	U
10	Name the different types of fuels used in nuclear reactors.	C303.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain the types of biogas plant in detail with neat sketch. (5 Marks)	C303.4	U
11 b	Explain the main components and working of tidal power plant. (5 Marks)	C303.4	U&AZ
	Or		
12	Write about selection of water turbine. Explain any one turbine with neat sketch used in hydroelectric power plant.	C303.4	R &U
13	Describe the layout of nuclear power plant with neat diagram.	C303.3	R&U
	Or		
14 a	Explain briefly pressurized water reactor with neat sketch. (5 Marks)	C303.3	R&U
14 b	Explain boiling water reactor with neat sketch. (5 Marks)	C303.3	R&U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the layout of hydroelectric power plant with neat diagram.	C303.4	R &U
	Or		
16	Explain the working of wind power plant with neat sketch.	C303.4	R &U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Name of faculty: R.Balasubramanian & A.R.Danila Shirly

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – I Set-1			Date/Session	24.07.18/AN	Marks	50
Course code	EE8353	Course Title	ELECTRICAL DRIVES AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/Section	III/A&B	Department	MECH	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define electrical drives. What are the advantages of Electrical drives?	205.1	U
2	Define the heating and cooling time constants.	205.1	U
3	Define back emf.	205.2	U
4	What are the basic elements of electrical drive?	205.1	E
5	What type of drive to be selected for a paper mill?	205.1	U
6	Give the applications of shunt and series motors.	205.1	U
7	Mention the power rating formulae for motors with linear load.	205.2	A
8	A motor has a thermal heating time constant of 45 minutes. When the motor runs continuously on full load its final temperature rises to 80 degree Celsius. What would be the temperature rise after 1 hour, if the motor runs continuously on full load ?	205.2	AZ
9	Why series motor never started on No load condition?	205.2	E
10	A motor of smaller rating can be selected for a short term duty. Why?	205.2	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain the different classes of duty with examples? (7)	205.1	A
11 b	What are types of electrical drive? Explain with example(3)	205.1	U
	or		
12	Derive the expression for torque speed and various characteristics of a motor.(10)	205.1	U
13	Derive the heating of a motor with necessary assumptions. (10)	205.1	A
	or		
14	Explain the selection of motor power rating for various loading conditions.(All 3 cases) (10)	205.1	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	The temperature rise of a motor when operating for 30 min. on full load is 35 degree Celsius and becomes 15 degree Celsius when the motor operates for another 30 minutes on the same load. Determine the heating time constant and steady state temperature rise.	205.2	AZ
	or		
16	A 500V DC shunt motor with constant field drives a load whose torque is proportional to the square of the speed. When running at 900 rpm it takes an armature current of 45A Find the speed at which the motor runs if a resistance of 8Ω is connected in series with armature ,R_a =1Ω.	205.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty In-charge : Mr.R.Vijay AP/EEE & Ms.N.Karthika AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – I			Date/Session	25-07-18 / AN	Marks	50
Course code	IC6501	Course Title	CONTROL SYSTEMS			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	III	Semester/Section	05 / A & B	Department	EEE	

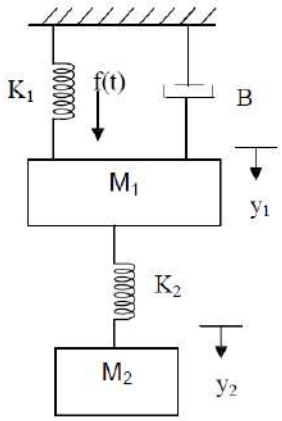
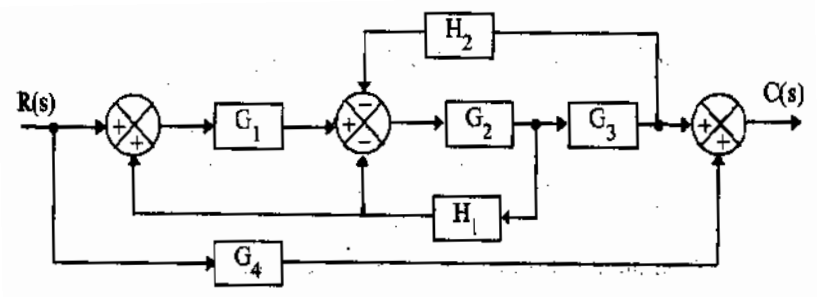
Part – A

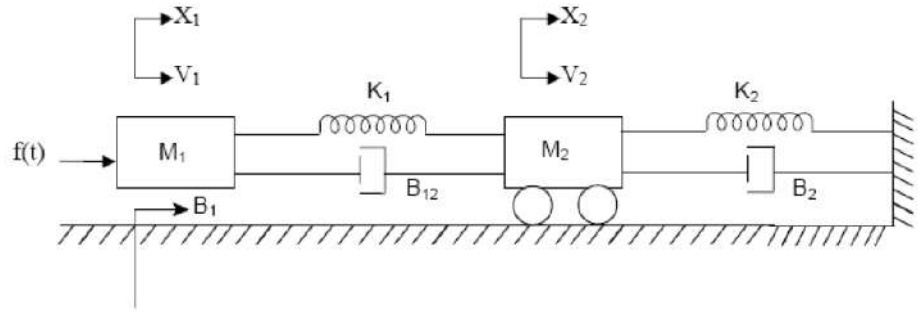
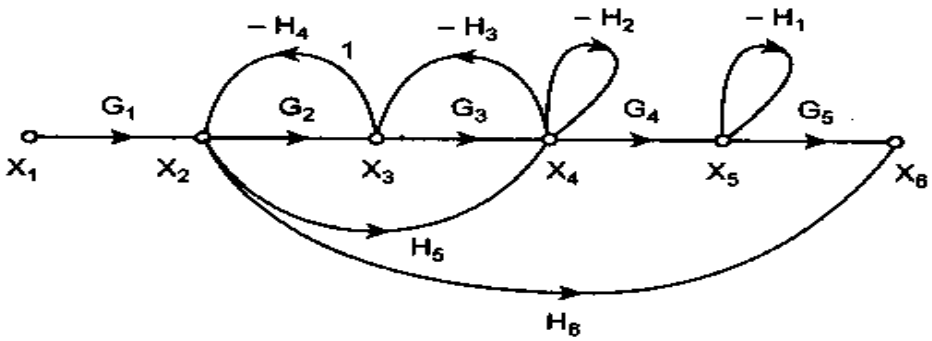
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define transfer function and write its advantages and disadvantages.	C306.1	R
2	Define open loop & closed loop control systems with examples.	C306.1	R
3	What is feedback? Why negative feedback is preferred in control systems?	C306.1	C
4	What is meant by 'block diagram' of a control system? What are the basic components of a block diagram?	C306.1	A
5	Write the analogous electrical elements in force voltage analogy for the elements of mechanical translational system.	C306.1	A
6	What are the basic elements used for modeling mechanical rotational system and write its torque equations?	C306.1	R
7	What is transmittance?	C306.1	R
8	What are the components of feedback control system?	C306.1	R
9	Write the mason's gain formula and Write the properties of signal flow graph.	C306.1	R
10	State the advantages of State space Analysis.	C306.6	AZ

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Determine the transfer function $Y_2(S)/F(S)$ of the system shown in fig. 	C306.1	E
	(OR)		
12	**Consider the block diagram shown in fig. Using reduction technique, obtain C(s)/R(s)** 	C306.1	E

13	**Write the differential equation governing the mechanical translational systems and find the transfer function. Draw the force voltage and force current electrical analogies shown in the fig.** 	**C306.1**	**C**
	(OR)		
14	 **Find the TF for the signal flow graph shown in fig.**	**C306.1**	**E**
	PART – C **(Answer all the questions 1 x 10 = 10marks)**		
15	**Test whether the given system is controllable & observable.** $\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\\ \dot{x}_3\end{bmatrix} = \begin{bmatrix}2 & -2 & 3\\ 1 & 1 & 1\\ 1 & 3 & -1\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\end{bmatrix} + \begin{bmatrix}11\\ 1\\ -14\end{bmatrix}[u]$ $Y = \begin{bmatrix}-3 & 5 & -2\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\end{bmatrix}$	**C306.6**	**A**
	(OR)		
16	**Test whether the given system is controllable & observable.** $\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\\ \dot{x}_3\end{bmatrix} = \begin{bmatrix}-6 & -11 & -6\\ 1 & 0 & 0\\ 0 & 1 & 0\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\end{bmatrix} + \begin{bmatrix}1\\ 0\\ 0\end{bmatrix}u$ $y = \begin{bmatrix}0 & 1 & 3\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\end{bmatrix}$	**C306.6**	**AZ**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty name: M.Marimuthu (A-sec), N.Vijayasarathi (B-sec)

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/Session	23.07.18/FN	Marks	50
Course code	EE6501	**Course Title**	POWER SYSTEM ANALYSIS			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	III	**Semester/Section**	V/A&B	**Department**	EEE	

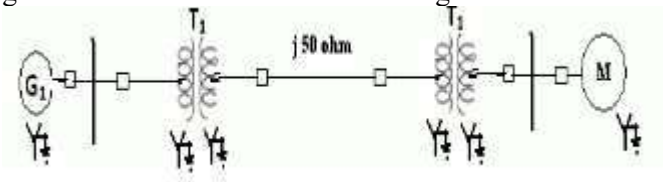
Part – A

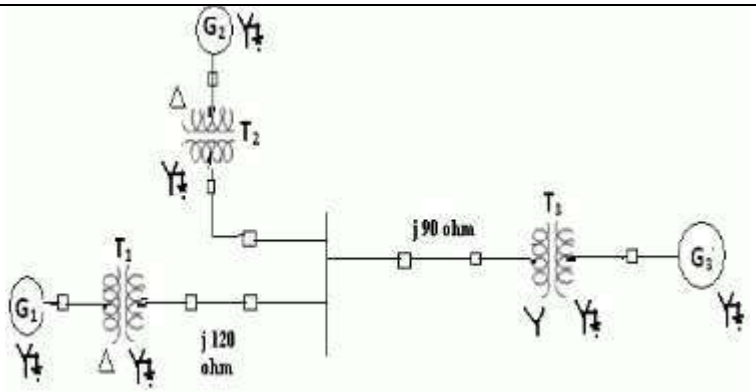
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Summarize the main division of power system	C301.1	R
2	A generator rated 25MVA, 11kV has a reactance of 15%. Calculate its p.u. reactance for a base of 50MVA and 10kV	C301.1	C
3	What is single line diagram?	C301.1	U
4	List the advantages of per unit system.	C301.1	A
5	Define bus impedance matrix.	C301.1	R
6	Order the methods available for forming bus impedance matrix	C301.1	E
7	Define restructure power system.	C301.1	R
8	List the types of buses.	C301.2	R
9	Describe the need for slack bus.	C301.2	AZ
10	Prepare the advantages and disadvantages of Gauss Seidal method.	C301.2	A

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Examine the reactance diagram for the power system shown in fig. Neglect resistance and use a base of 100MVA , 220kV in 50KΩ line. The ratings of the generator motor and transformer are give below.  Generator: 40MVA, 25kV, X'' =20%. Synchronous Motor: 50MVA, 11kV, X'' =30% T1: Y-Y transformer : 40MVA 33/220kV, X=15% T2:Y- Y transformer : 30 MVA 11/220kV, X=15%	C301.1	A
	or		
12	The single line diagram of a simple power system is shown in Fig. The rating of the generators and transformers are given below: Generator 1: 25MVA, 6.6kV, X=0.2p.u Generator 2: 5MVA, 6.6kV, X=0.15p.u Generator 3: 30MVA, 13.2kV, X=0.15p.u Transformer1: 30MVA, 6.9Δ/115Y kV, X=10% Transformer2: 15MVA, 6.9Δ/115Y kV, X=10% Transformer3: Single phase units each rated 10MVA, 6.9/69 kV, X=10% Examine the impedance diagram and mark all values in p.u choosing a base of 30MVA, 6.6kV in the generator 1 circuit.	C301.1	U

<table>
<tr><td></td><td> 
</td><td></td><td></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>13</td><td>The parameters of a four system are as under:
<table>
<tr><th>Line No.</th><th>Line starting bus</th><th>Line ending bus</th><th>Line impedance(pu)</th><th>Line Charging Admittance(pu)</th></tr>
<tr><td>1</td><td>1</td><td>2</td><td>0.2+j0.8</td><td>j0.02</td></tr>
<tr><td>2</td><td>2</td><td>3</td><td>0.3+j0.9</td><td>j0.03</td></tr>
<tr><td>3</td><td>2</td><td>4</td><td>0.25+j1.0</td><td>j0.04</td></tr>
<tr><td>4</td><td>3</td><td>4</td><td>0.2+j0.8</td><td>j0.02</td></tr>
<tr><td>5</td><td>1</td><td>3</td><td>0.1+j0.4</td><td>j0.01</td></tr>
</table>
Point out the Network and find bus admittance matrix</td><td>C301.1</td><td>A</td></tr>
<tr><td colspan="4">or</td></tr>
<tr><td>14</td><td>Explain in detailed the three major restructure Models in power system</td><td>C301.1</td><td>R</td></tr>
</table>

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Prepare the load flow algorithm using Gauss Seidal method with flow chart and discuss the advantages of the method.	C301.2	R
	or		
16	Explain the types of buses and derive the power flow equations in load flow analysis.	C301.2	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Name of the Faculty:

1. Dr.M.V.Suganyadevi, ASP/EEE
2. Mr. B.Paranthagan, ASP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/Session	23-07-18/AN	Marks	50
Course code	EE6503	Course Title	POWER ELECTRONICS			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	2018	Semester/Section	V / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define Latching current.	1	R
2	What is softness factor of diodes?	1	R
3	Define Turn off time of SCR.	1	U
4	What is the turn-off time for converter grade SCRs?	1	U
5	Compare power diodes and signal diodes.	1	AZ
6	What is the function of freewheeling diodes in controlled rectifier?	2	A
7	What is meant by phase controlled rectifier?	2	R
8	Compare semiconverter and fully controlled converter.	2	AZ
9	Mention some applications of converter.	2	U
10	What is meant by extinction angle?	2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Discuss in detail, the switching characteristic of SCR.	1	R
	or		
12 a	Draw the structure of power diode and explain its operating principle briefly	1	R
12 b	Draw the reverse recovery characteristic of power diode.	1	R
13	Explain the working of single phase two pulse fully controlled converter with RL load in discontinuous conduction mode with relevant diagrams and derive the formula for average output voltage and current.	2	U
	or		
14	Explain the operation of three phase 3 pulse converter with R load. Derive the expression for average output voltage.	2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A single phase fully controlled bridge converter from a 230V, 50HZ single phase supply with a load resistance R = 10 ohm. If the firing angle α = 30° Determine, a. Average output voltage and current b. RMS output voltage and current c. Rectification efficiency d. Transformer utilization factor.	2	E
	OR		
16	A single phase 230V, 1KW heater is connected to a half wave controlled rectifier and it is fed from a 220V, 50Hz supply. Determine the power absorbed by the heater when firing angle is a) $\alpha = 45^0$ b) $\alpha = 60^0$.	2	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Name of Faculty : Mr. S.Ramprasath / AP /EEE/A section and Mr. R.Balasubramanian /Asso Prof / EEE /B section

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/Session	24-07-18/AN	Marks	50
Course code	EE6504	Course Title	Electrical Machines-II			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	III	Semester/Section	V / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	How can you distinguish between the two types of large synchronous generator from their appearance?	C305.1	U
2	What do you mean by single layer and double layer winding?	C305.1	U
3	Define pitch factor and distribution factor.	C305.1	R
4	State the requirements for paralleling alternators.	C305.1	R
5	Why distributed winding is more preferred over concentrated winding?	C305.1	U
6	What are the necessities for chording in armature winding of a synchronous machine?	C305.1	U
7	Define voltage regulation of an alternator.	C305.1	R
8	Calculate the distribution factor for a 36 slot,4-pole,single layer 3-phase winding.	C305.1	U
9	What is meant by hunting in Synchronous motor and Synchronous generator?	C305.2	U
10	List any two merits, demerits and applications of Synchronous motor	C305.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Derive the emf equation of an alternator and calculate the induced emf between the lines of a given 3 phase, 8 pole, 750rpm, star connected alternator having 72 slots on armature, each slot has 12 conductors and winding is short chorded by 2 slots, the flux per pole is 0.06Wb. (5)	C305.1	U
11 b	A 3 phase water wheel generator is rated at 100MVA, unity power factor, 11kV, star connected 50Hz, 120 rpm. Determine (i)The number of poles (ii)The kW rating (iii)The current rating (iv).The input at rated kW load if the efficiency is 97%(excluding the field loss) (v)Prime mover torque applied to the generator shaft. (5)	C305.1	U
	Or		
12 a	Define armature reaction and explain the effect of armature reaction on different power factor loads of synchronous generators. (5)	C305.1	U
12 b	The following test results are obtained for a 6600v alternator. I_f (A): 16, 25, 37.5, 50, 70 EMF (V): 3100, 4900, 6600, 7500, 8300 A field current of 20A is found necessary to circulate full load current on short circuit of armature. Calculate by (i).mmf (ii).emf method, full load regulation at 0.8pf (lagging).Neglect armature resistance. (5)	C305.1	U
13	Explain in detail the method of starting of synchronous motor. (10)	C305.2	U

	Or		
14	**With neat sketch draw and explain the construction details, working principles of synchronous motor and explain the methods used to make self-starting. (10)**	**C305.2**	**U**

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	**A 3 phase star connected synchronous generator is rated at 1.5MVA, 11kV.The armature effective resistance and synchronous reactance are 1.2Ω and 25Ω respectively per phase. Calculate the percentage voltage regulation for a load of 1.4375MVA at 0.8pf lagging and (ii) 0.8pf leading. Also find out the power factor at which the regulation becomes zero. (10)**	**C305.1**	**U**
	Or		
16	**A 3.5MVA,star connected alternator rated at 4160V at 50Hz, has the open circuit characteristics given by the following data.** I_f (A) | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 EMF (V) | 1620 | 3150 | 4160 | 4750 | 5130 | 5370 | 5550 | 5650 | 5750 **A field current of 200A is found necessary to circulate full load current on short circuit of alternator. Calculate by (i).Ampere turn method (ii).Synchronous impedance method, the full load voltage regulation at 0.8 power factor lagging. Neglect resistance. Comment on result obtained. (10)**	**C305.1**	**U**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In Charge : Mr. P. Ramesh Babu & P.K. Arunkumar

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	25.07.2018 / FN	Marks	50
Course code	ME6701	**Course Title**	Power Plant Engineering			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	III	**Semester/ Section**	V 'A'&'B'	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is the use of spill ways?	C303.4	U
2	What are the components of tidal power station?	C303.4	AZ
3	What is biogas plant? List the classification of bio gas power plant?	C303.4	U
4	What is the function of Draft tube?	C303.4	R
5	Define turbines and its types.	C303.4	U
6	What is meant by fuel cell?	C303.4	R
7	Why shielding is necessary in nuclear power plant?	C303.3	U
8	Differentiate nuclear fission and fusion.	C303.3	R
9	What are the important properties that a control rod should possess?	C303.3	U
10	What is the function of reflector used in nuclear power plant?	C303.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain the types of biogas plant in detail with neat sketch.	C303.4	U
11 b	Explain the working of Francis turbine. Give its merits and demerits.	C303.4	U&AZ
	Or		
12	Explain site selection criteria for hydroelectric power plant.	C303.4	R &U
13	Describe the layout of nuclear power plant with neat diagram.	C303.3	R&U
	Or		
14 a	Explain briefly pressurized water reactor with neat sketch.	C303.3	R&U
14 b	Explain boiling water reactor with neat sketch.	C303.3	R&U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the layout of hydroelectric power plant with neat diagram.	C303.4	R &U
	Or		
16	Explain in detail about the working of solar thermal power plant with neat diagram.	C303.4	R &U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Name of the faculty: Dr.S. Thamizharasan and N.Saranya

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/Session	24-07-17/FN	Marks	50
Course code	PX5005	Course Title	HVDC transmission			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	2018	Semester/Section	II / 'A'	Department	ME - PED	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions
1	Name the new modern trends in DC transmission.
2	What is the need for HVDC transmission?
3	What is the application of HVDC transmission systems?
4	What is the significance of using light triggered thyristors in HVDC transmission?
5	What is twelve pulse converters?
6	What is the use of tap changing transformer in HVDC transmission?
7	What is valve utilization factor?
8	Mention different types of DC links.
9	What are the requirements of good simulation tool?
10	List the basic requirements of firing pulse generator?

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions
11	Draw the schematic diagram of typical HVDC converter station and explain the functions of various components available
	or
12 a	Compare AC and DC transmission system based on economic, technical performance aspects and reliability
12 b	List out some modern trends in DC transmission
13	Explain the principle operation of a six pulse Graetz circuit with neat diagram and derive the expression for load voltage and load current.
	or
14	Explain the characteristics of 12 pulse converters?
	Part - C (10 marks)
15	A Graetz bridge operates with a delay angle of 15°. The leakage reactance of the transformer is 10 Ω. The line to line AC voltage is 85 kV. Compute the overlap angle and DC voltage for (i) $I_d = 2000$ A (ii) $I_d = 4500$ A.

Faculty In charge: S.Ramprasath / AP /EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	24.07.2018/FN	Marks	50
Course code	PS5072	Course Title	Solar and Energy Storage Systems			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/ Section	III	Department	PED	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define particle-wave duality and write the equation	C202.1	R
2	Define doping	C202.1	R
3	Define solar irradiance	C202.1	R
4	What is typical meteorological (TMY) data?	C202.1	E
5	Explain fill factor?	C202.1	E
6	Explanation declination angle.	C202.1	E
7	Draw the electrical characteristics of semiconductor?	C202.1	A
8	Mention the reason for low efficiency in solar cells	C202.1	A
9	What are the requirements of inverters used in stand -alone PV systems?	C202.2	A
10	What are super capacitors? State its advantages.	C202.2	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain the characteristics of sunlight.(4)	C202.1	E
11 b	Draw the cross section of a typical solar cell and describe how it works.(6)	C202.1	E
	or		
12	Outline the importance aspects of PV cell interconnection	C202.1	E
13	What are the types of energy storage systems available, explain their features, suitability and applications	C202.2	E
	or		
14	Explain the components of power conditioning in PV system and also explain various regulators.	C202.2	E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain in detail MPPT with algorithms.	C202.2	A
	or		
16	Draw a simplified stand alone PV power system and explain its design procedure with an example	C202.2	A

Staff Incharge: V.Ajitha /AP/EEE *Program Co-ordinator*

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/Session	25-07-18 (AN)	Marks	50
Course code	EE6008	Course Title	MICRO CONTROLLER BASED SYSTEM DESIGN			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	IV	Semester/Section	VII /A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the benefits of having RISC architecture?	C406.1	R
2	Define Brown out reset mode.	C202.1	U
3	Write about the Status Register of PIC Microcontroller.	C406.1	R
4	List out all the addressing Modes in PIC Microcontroller.	C406.1	AZ
5	Difference between Microcontroller and PIC Microcontroller.	C406.1	U
6	Mention the interrupt available in PIC Microcontroller	C406.2	R
7	Write an ALP to initialize the PORT A using PIC microcontroller.	C406.2	AZ
8	What is the minimum and maximum clock frequency for PIC 16CXX?	C406.2	AZ
9	What is the role of TRISx register in I/O port Management?	C406.2	R
10	Define Subroutine.	C406.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Discuss in detail about memory organization of a PIC microcontroller.	C406.1	R
	or		
12	With neat functional block diagram explain the architecture of PIC16C7X Microcontroller in detail.	C406.1	R
13	Explain the concept of interrupt logic and interrupt structure of PIC microcontroller with an example.	C406.2	E
	or		
14	Briefly explain the Timer 1 operation of PIC 16C6X using schematic diagram.	C406.2	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the functionality of Timer for PIC Microcontroller with a suitable diagram.	C406.2	AZ
	or		
16	Write an ALP for addition of two 16 bit numbers.	C406.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Staff In-Charge : Dr.S. Vijayalakshmi/Asso. Prof/EEE, B. Paranthagan/ Asso. Prof./EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/Session	25.07.18/FN	Marks	50
Course code	EE6701	Course Title	HIGH VOLTAGE ENGINEERING			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/Section	VII / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is direct and induced lightning?	C401.1	U
2	Define Isokeraunic level.	C401.1	U
3	Define surge impedance of a line.	C401.1	R
4	List out the origin of switching surges.	C401.1	E
5	How switching overvoltages be controlled?	C401.1	A
6	What is ionization by collision?	C401.2	R
7	State Paschen's law.	C401.2	R
8	Commercial liquid dielectrics are different from pure liquid dielectrics? Justify.	C401.2	C
9	Define Townsend's first ionization coefficient.	C401.2	U
10	Define intrinsic strength of a solid dielectric.	C401.2	U

Part – B

(Answer all the questions 2 x 20 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the mechanism of lightning stroke and mathematical modeling of lightning.	C401.1	C
	or		
12	Discuss in detail about the reflection and refraction of travelling waves.	C401.1	U
13	Explain various theories that explain breakdown in commercial liquid dielectrics.	C401.2	U
	or		
14	How breakdown occur in solid dielectrics due to thermal and internal discharges?	C401.2	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

15	With neat sketch explain the protective devices used for protection against lightning.	C401.1	E
	or		
16	Explain different theories of charge formation in clouds.	C401.1	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Faculty: R.SATHEESH-EEE & S.SIVAKUMAR-EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/Session	23-07-18/FN	Marks	50
Course code	EE6702	Course Title	Power System Protection and Switchgear			
Batch No.		Duration	90 mins	Academic Year		2018 - 2019
Year	IV	Semester/Section	VII / A & B	Department		EEE

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define PSM in relay.	C402.1	R
2	What are the necessities of grounding?	C402.1	U
3	What are the functions of protective schemes?	C402.1	U
4	Define the term pickup and reach of a relay.	C402.1	R
5	Why earth wire is provided in overhead transmission line?	C402.1	U
6	What is negative sequence relay?	C402.2	U
7	What is under frequency relay?	C402.2	U
8	In what way a distance relay is superior to overcurrent protection relay for transmission line?	C402.2	U
9	What are the advantages of static relay?	C402.2	U
10	What is the principle of differential relay?	C402.2	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Discuss in detail about Peterson coil and list the protective functions performed by this device with neat sketch.	C402.1	U
	Or		
12	Explain in detail about various zones of protection with their types.	C402.1	U
13	What is distance relay and explain their types with neat sketch.	C402.2	U
	Or		
14	Explain the working of various differential relay with neat sketch.	C402.2	U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the construction and operating principles of induction type directional over current relay.	C402.2	U
	Or		
16	Describe the various types of electromechanical relay with neat sketch.	C402.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Incharge : Dr.C.Kriahnakumar, Prof& HoD/EEE & P.K.Arun Kumar, AP/EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test - I			Date/ Session	24/07/2018 FN	Marks	50
Course code	EE6703	Course Title	SPECIAL ELECTRICAL MACHINES			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/ Section	VII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	List the types of rotor available in SyRM.	C403.1	R
2	Draw the phasor diagram of SyRM.	C403.1	R
3	What is Switched Reluctance Motor?	C403.2	U
4	Define Reluctance Torque.	C403.1	R
5	Illustrate the different modes of operation of SRM.	C403.2	A
6	Mention the basic requirements of SRM.	C403.2	U
7	List the applications of SyRM	C403.2	R
8	Draw the Torque-Speed Characteristics of SyRM.	C403.1	R
9	Why rotor position sensor is essential for the operation of SRM?	C403.2	A
10	Write the Voltage equation of SRM.	C403.1	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Describe the construction and working principle of SyRM with a neat diagram with their merits and demerits.	C403.1	R
	or		
12 a)	Explain the construction and working of Vernier motor.	C403.1	U
12 b)	A three phase 400V,50Hz, 4 pole, star connected synchronous reluctance motor with negligible armature resistance has X_{sd}=8Ω and X_{sq}=2Ω .The load angle is 12.38 degrees, for a load torque of 80N-m. Calculate the Line current and Input Powerfactor.	C403.1	E
13	Explain the Construction and Working principle of Switched Reluctance Motor.	C403.2	U
	or		
14 a)	Describe the Torque-Speed Characteristics of Switched Reluctance Motor.	C403.2	R
14 b)	Derive the Torque equation of Switched Reluctance Motor.	C403.2	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss the working of two power semiconductor switches and two diodes per phase to excite the phase winding of SRM with their merits and demerits	C403.2	U
	or		
16	Explain the working of (n+1) power switching devices and (n+1) diodes and Phase winding using Bifilar wires power controller circuits to drive SRM.	C403.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	23.07.2018/AN	Marks	50
Course code	EE6005	Course Title	POWER QUALITY			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	IV	Semester/ Section	VII / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	How can be the power quality problems detected?	C405E4.1	A
2.	What are the components of waveform distortion?	C405E4.1	R
3.	What do you mean by power frequency variation?	C405E4.1	R
4.	List the major power quality issues.	C405E4.1	R
5.	Classify power quality events in short duration events.	C405E4.1	E
6.	List some industry standards associated with voltage sags.	C405E4.2	R
7.	What are the three levels of possible solutions to voltage sag and momentary interruption problems?	C405E4.2	AZ
8.	Define active series compensator.	C405E4.2	R
9.	What is the depth of voltage dip?	C405E4.2	U
10.	What are the sources of sag and interruption?	C405E4.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Discuss the following characteristics of power quality events. i) Short duration variations ii) Long duration variations iii) Discuss in detail about transients.	C405E4.1	AZ
	OR		
12.	Explain about the IEEE and IEC standards related to power quality	C405E4.1	U
13.	Discuss about the Computer Business Equipment Manufactures Associations (CBEMA). Explain about the events described in the curve.	C405E4.1	U, A
	OR		
14.	Explain the ITIC curve with a diagram	C405E4.1	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	What is the need of estimating sag performance? Explain the different methods of estimating voltage sag performance.	C405E4.2	U
	OR		
16.	What are the different voltage sag mitigation techniques ? Explain in details.	C405E4.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Name of the Faculty:
Dr.M.V.Suganyadevi, ASP/EEE
Mr.T.Tamilarasan, AP/EEE

Saranathan College of Engineering

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Internal Assessment Test - I			Date/Session	24.07.18/AN	Marks	50
Course code	MG6851	Course Title	PRINCIPLES OF MANAGEMENT			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/Section	VII / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define Management.	C404.1	U&C
2	Distinguish between Management and Administration.	C404.1	U&C
3	Differentiate Manager from Entrepreneur.	C404.1	U&C
4	What are the various levels of Management?	C404.1	U&C
5	List the functions of Management.	C404.1	U&C
6	Mention any 4 forms of organization.	C404.1	U&C
7	What is Bureaucratic Management?	C404.1	U&C
8	What is Decentralization?	C404.1	U&C
9	Define Planning.	C404.2	U&C
10	List any 2 features of Planning.	C404.2	U&C

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Comment and discuss on the contribution of Henry Fayol's Principles to the success of management.	C404.1	U&C
	Or		
12	Explain in detail on the various Business Environmental factors influencing the managerial decision making. Give examples	C404.1	U&C
13	Explain the various Managerial Roles coined by Henry Mintzberg with examples.	C404.2	U&C
	Or		
14	What are the various steps involved in Planning? Discuss.	C404.2	U&C

Part – C

(Answer all the questions 1 x 10 = 10marks) Case study

15		CO	Skills
	Bharath Products Ltd. is a big factory with a turnover of Rs. 10 crore and with 400 workers. You have been in the office of its Factory Manager, Mr. Kaushik for nearly 40 minutes. During this short period, you have found that your conversation with him has been interrupted several times. First, it was the Office Manager who rang him to get his approval for samples of office stationery. Mr. Kaushik sends for the samples. Then comes the ring from a supplier who informs Mr. Kaushik that a particular part of machinery, which is otherwise not available in the market can be had from him. Mr. Kaushik rings the store keeper to purchase this part immediately from the supplier and to cancel the order, if any, which the purchase manager might have placed. Then there is a ring from a customer requesting Kaushik to allow a higher percentage of discount than that promised by the company's Sales Manager. Kaushik not only turns down the request but also expresses his surprise at the high percentage already allowed by the Sales Manager. Finally, a foreman enters and complains that a certain part of one machine is broken and is not being available in the stock. Hence, the production may suffer. Mr.Kaushik asks the foreman to tell the purchase manager to order the part immediately. **Question:-** Is Mr. Kaushik performing the job of a Manager? What are your suggestions to improve his managerial style?	C404.1	A

SARANATHAN COLLEGE OF ENGINEERING
Internal Assessment Test –I: ODD Semester 2018-19
PX5072 – Power Eectronics for Renewable Energy Systems
Year : II **Branch: M.E (PED)**
Duration : 1 ½ Hour **Max. Marks: 50**

Answer all the questions
Part A: 10 x 2 = 20

1. Give any two environmental aspects of electric energy conversation.
2. List out the types of Fuel cells.
3. List various renewable energy resources.
4. Summarize the significance of renewable energy.
5. List the limitations of Tidal energy.
6. Discuss about anaerobic digestion? And its advantages
7. What is SOFC? State its limitations.
8. List the wind turbine used for domestic application.
9. Discuss how to use hydrogen energy to generate electric power.
10. What are the problems associated with tapping solar energy

Part B: 2 x 15 = 30

11. How does environment get affected by the use of the renewable energy? And also discuss the GHG emissions from the various energy sources.

(OR)

12. What are the types of Ocean Thermal Energy conversion power plants? Describe in detail the Anderson OTEC cycle.

13. Explain the working principle of wind energy conversion system with a neat sketch

(OR)

14. Draw the schematic diagram of Boost converter and explain the operation detail.

Name of the Faculty : N.Shobana (AP / EEE)

SARANATHAN COLLEGE OF ENGINEERING
Internal Assessment Test –I: EVEN Semester 2017-18
PX5072 – Power Eectronics for Renewable Energy Systems
Year : II **Branch: M.E (PED)**
Duration : 1 ½ Hour **Max. Marks: 50**

Answer all the questions
Part A: 10 x 2 = 20

1. Give any two environmental aspects of electric energy conversation.
2. List out the types of Fuel cells.
3. List various renewable energy resources.
4. Summarize the significance of renewable energy.
5. List the limitations of Tidal energy.
6. Discuss about anaerobic digestion? And its advantages
7. What is SOFC? State its limitations.
8. List the wind turbine used for domestic application.
9. Discuss how to use hydrogen energy to generate electric power.
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Part B: 2 x 15 = 30

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(OR)

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13. Explain the working principle of wind energy conversion system with a neat sketch

(OR)

14. Draw the schematic diagram of Boost converter and explain the operation detail.

Name of the Faculty : N.Shobana (AP / EEE)

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	27.08.2018/ FN	Marks	50
Course code	EC8353	Course Title	Electron Devices And Circuits			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/ Section	III	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the difference between JFET and MOSFET?	C205.2	U
2	What is peak point voltage in UJT?	C205.2	R
3	Show how SCR can be triggered on by the application of a pulse to the gate terminal.	C205.2	R
4	What is latching current?	C205.2	R
5	Draw the two transistor equivalent circuit of SCR?	C205.2	R
6	Why must the base be narrow for the transistor action?	C205.3	R
7	What are the tools used for small signal analysis of BJT?	C205.3	E
8	Define the four h-parameters.	C205.3	U
9	Which is the best BJT configuration is suitable for impedance matching application and why?	C205.3	R
10	Why CE configuration is most popular in amplifier circuits?	C205.3	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Sketch the construction of an SCR and explain the device operation. Also draw and explain the V-I characteristics of SCR.	C205.2	U
	Or		
12	Explain the construction, operation and characteristics of UJT.	C205.2	R &U
13	Derive the expression for input impedance, output impedance and voltage gain of a CE transistor amplifier.	C205.3	R,U&AZ
	Or		
14	Discuss the operation of CB transistor amplifier and derive the expression for current gain, input impedance and voltage gain.	C205.3	R,U&AZ

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the working principle and characteristics of depletion type MOSFET? Discuss elaborately the drain current characteristics and transfer characteristics of MOSFET.	C205.2	R &U
	Or		
16	Describe the various biasing circuits of transistor amplifier.	C205.2	U &E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Course handling faculties

Dr. S. Thamizharasan Asso.Prof/ EEE

Venugopal R AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II Set-1				Date/Session	29.8.18/AN	Marks	50
Course code	EE8301	Course Title	ELECTRICAL MACHINES -I				
Batch No.		Duration	90 mins	Academic Year	2018 - 2019		
Year/	II	Semester/Section	III/A&B	Department	EEE		

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define mmf and reluctance.	C204.1	R
2	State Right hand thumb rule.	C204.1	U
3	Define relative permeability.	C204.1	R
4	Name the main magnetic quantities with their symbols.	C204.1	R
5	What is meant by magnetic circuits?	C204.1	R
6	State the advantages and disadvantages of Hopkinson's test.	C204.6	R
7	What are the losses occurring in a dc machine?	C204.6	R
8	Explain why Swinburne's test cannot be performed on dc series motor.	C204.6	AZ
9	When can we obtain maximum efficiency in a dc machine?	C204.6	R
10	State the function of no volt coil of the starter.	C204.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Mention the various methods of braking of dc motors. Explain Regenerative braking in detail.	C204.6	U
	or		
12	Explain the Hopkinson's test for determining efficiency of two similar dc shunt machines with neat diagram.	C204.6	U
13	Explain in detail Ward-Leonard method of speed control in dc motors.	C204.6	U
	or		
14	What are the various starting methods of dc motor? Explain any one in detail.	C204.6	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A ring composed of three sections. The cross section area is 0.001m^2 for each section. The mean arc length are la= 0.3m, lb =0.2m, lc=0.1m, an air gap of length of 0.1mm is cut in the ring, permeability for sections a,b and c are 5000,1000 and 10000 respectively. Flux in the air gap is 7.5*10^-4 Wb. Find i) mmf ii) Exciting current if the coil has 100 turns iii) Reluctance of the sections.	C204.1	A
	or		
16	A 100kW dc shunt generator driven by a belt from an engine runs at 750 rpm and is connected to 230v dc mains. When the belt breaks, it continues to run as a motor drawing 9 kW from the mains. At what speed would it run? Given: Armature resistance = 0.018 ohm and field resistance is 115ohm.	C204.1	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: P.Pushpa,AP/EEE & R.Vijay, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	28.08.2018 /AN	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What do u mean by race around condition in a flip-flop?	C201.3	U
2	Convert T flipflop to D flipflop?	C201.3	A
3	What is edge triggered flip-flops?	C201.3	R
4	Differentiate between mealy and moore models.	C201.3	R
5	Differentiate a latch and a flipflop.	C201.3	R,U
6	Give the state diagram of JK and D flipflop.	C201.3	R,A
7	Give the excitation table of SR And T flipflop.	C201.3	R,A
8	What is lockout? How it is avoided?	C201.3	R,C
9	Implement full adder with a 3×8 decoder	C201.2	AZ
10	Differentiate between a decoder and Demux.	C201.2	R,A

Part – B

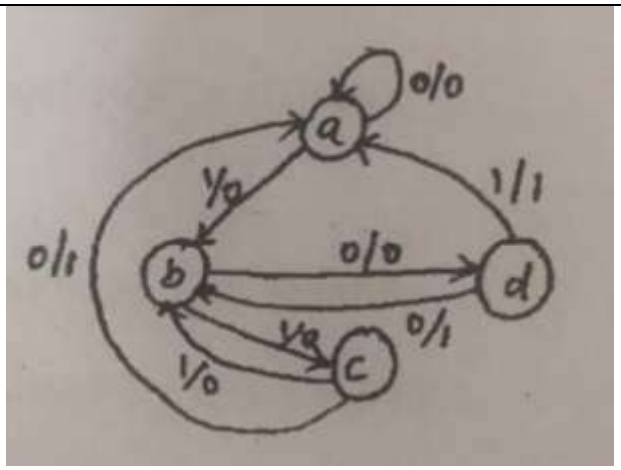
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain the circuit of a SR flip flop using NOR and explain its operation.(5)	C201.3	E,U
11 b	Explain the operation of a master slave JK flip flop.(5)	C201.3	E,U
	or		
12	Design a synchronous counter using SR flip flop to count the following sequence 7,4,3,1,5,0,7……	C201.3	AZ
13	A sequential circuit has two JK flip flops A and B, two inputs x,y and one output z. The flip flop input equations and circuit equations are: $J_A = Bx + B'y$; $K_A = B'xy$; $J_B = A'x$; $K_B = A + xy$; $z = Ax'y' + Bxy$ a)Draw the logic diagram of the circuit b) Tabulate the state table c) Derive the state equation for A and B.	C201.3	AZ
	or		
14 a	Explain in detail about different shift registers.(5)	C201.3	U,E
14 b	Explain the realization of JK flip flop from T flip flop.(5)	C201.3	E,A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss a synchronous decade counter using T flip flop and construct the timing diagram.(8+2)	C201.3	AZ
	or		

16	 Design a clocked sequential machine using T FF for the following diagram. Use state reduction if possible.	C201.3	AZ

Staff Incharge: V. Ajitha /AP/EEE/Dr.S. Vijayalakshmi/Asso. Prof/EEE

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – II			Date/Session	28-08-2018 /FN	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2018 – 2019	
Year	II	Semester/Section	III/ A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Find the electric field intensity in free space if $\vec{D} = 30\ a_x\ C/m^2$.	C203.3	E
2	State the properties of electric flux lines.	C203.3	U
3	Write down the Poisson's and Laplace equations and give the significant physical differences.	C203.3	A
4	Define dipole moment and electric polarization.	C203.3	R
5	Distinguish electric scalar potential and potential difference.	C203.3	U
6	Determine the value of magnetic field intensity at the centre of a circular loop carrying a current of 10A. The radius of the loop is 2m.	C203.4	E
7	Define Biot - Savart law.	C203.4	R
8	State ampere's law. Must the path of integration be circular? Explain.	C203.4	U
9	Define the magnetic moment & Write Short note on - magnetic energy density.	C203.4	U
10	Define self inductance and mutual inductance & write down the equations for co- efficient of coupling.	C203.4	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive an expression for potential (V) and electric field intensity ($\vec{E}$) due to an Electric Dipole and also derive potential due to infinite uniformly charged line.	C203.3	E
	Or		
12 a	Derive an expression for the capacitance of a parallel plate capacitor.(5)	C203.3	E
12 b	Derive the boundary conditions of the normal and tangential components of electric field at the interface of two media with different dielectrics.(5)	C203.3	AZ
13	Derive the expression for magnetic flux density and magnetic field intensity due to an infinitely long conductor.	C203.4	E
	Or		
14 a	Derive an expression for boundary conditions in magnetic fields. (5)	C203.4	E
14 b	Calculate the inductance of co-axial cable. (5)	C203.4	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Two point charges -4 μC and 5 μC are located at (2,-1, 3) and (0, 4,-2) respectively. Find the potential at (1, 0, 1) assuming zero potential at infinity.	C203.3	AZ
	Or		
16	Given electric field, $\vec{E} = 40xy\ a_x + 20x^2\ a_y + 2\ a_z$ (V/m). Calculate V_{pq} . Given that p (1,-1, 0) and Q (2, 1, 3)..	C203.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Name of the faculty : P. Magdelin Jennifer Princy & N. Gayathri

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/ Session	29.08.2018 / FN	Marks	50
Course code	ME8792	**Course Title**	Power Plant Engineering			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	II	**Semester/ Section**	III/A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is meant by cooling Towers?	C206.1	U
2	What is the function of super heaters in a thermal plant?	C206.1	AZ
3	What is thermodynamic cycle?	C206.1	U
4	What is the mechanism of pulverised firing system?	C206.1	R
5	What do you understand by the term boiler draught?	C206.1	U
6	What are the different types of draught system?	C206.1	R
7	State the merits and demerits of closed cycle gas turbine over open cycle gas turbine power plant.	C206.2	U
8	Write two advantages of diesel power plants.	C206.2	R
9	Distinguish between PHWR and LMFBR.	C206.3	U
10	Why is a liquid metal the preferred coolant in a fast breeder reactor?	C206.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the Gas cooled reactor with a neat sketch and mention its advantages and disadvantages	C206.3	U&AZ
	Or		
12	Draw a neat sketch on CANDU reactor and explain its working principle and give its advantage and disadvantage	C206.3	AZ &U
13	Explain layout of thermal (or) Steam power plant.	C206.1	R&U
	Or		
14	Explain with a neat sketch the function of Bension Boiler and Give its advantages and disadvantages.	C206.1	R&U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Draw a layout of diesel power plant, showing various systems and explain each system in detail	C206.2	R &U
	Or		
16	Explain with a neat sketch i. Open cycle gas turbine power plant. ii. Closed cycle gas turbine power plant.	C206.2	R &U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Name of faculty: R.Balasubramanian & A.R.Danila Shirly

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – II			Date/Session	29-08-18 / FN	Marks	50
Course code	IC6501	Course Title	CONTROL SYSTEMS			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	III	Semester/Section	05 / A & B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are transient and steady state response of a control system?	C306.2	R
2	Define damping ratio? How can we classify second order system based on damping ratio?	C306.2	AZ
3	Define rise time, delay time, peak time, peak over shoot	C306.2	R
4	What are the effects of damping ratio on the time response of a second order system?	C306.2	AZ
5	What is type number and order of a system? What is its significance?	C306.2	U
6	What is steady state error? Define static error constants.	C306.2	U
7	What are generalized error coefficients? Give the relation between generalized and static error coefficients.	C306.2	R
8	State the rule for obtaining the breakaway point in root locus.	C306.2	R
9	List & explain the Frequency domain specifications?	C306.3	R
10	What is meant by `Corner frequency' in frequency response analysis?	C306.3	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive the expressions for second order system when the input is unit step for under damped & over damped case and sketch the response.	C306.2	E
	(OR)		
12	The unity feedback system is characterized by an open loop transfer function $G(s) = \frac{K}{S(S+10)}$. Determine the gain K, so that the system will have a damping ratio of 0.5. For this value of K, determine settling time, rise time, peak overshoot and time to peak overshoot for a unit step input. Also determine its output response c (t) for unit step input.	C306.2	AZ
13	A unity feedback system has the forward transfer function $G(s) = \frac{10(S+2)}{S^2(S+1)}$. The input $r(s) = \frac{3}{S} - \frac{2}{S^2} + \frac{1}{3S^3}$ is applied to the system. Determine the steady state error and static error constants.	C306.2	E
	(OR)		
14	Sketch the root locus for the open loop transfer function of unity feedback control system given below: G(S) H(S)= $\frac{K}{S(S+2)(S+4)}$. Find the value of K so that the damping ratio of the closed loop system is 0.5	C306.2	E
	PART – C (Answer all the questions 1 x 10 = 10marks)		
15	Plot the Bode diagram for the following transfer function and obtain the gain, phase cross over frequencies , gain margin & phase margin: G(S) = $\frac{10}{S(1+0.4S)(1+0.1S)}$	C306.3	C

	(OR)		
16	**The open loop transfer function of a unity feedback system is G(S) = $\frac{1}{S(1+S)(1+2S)}$. Sketch the Polar plot and determine the Gain margin and Phase margin.**	**C306.3**	**C**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty name: M.Marimuthu (A-sec), N.Vijayasarathi (B-sec)

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	29.08.2018 / AN	Marks	50
Course code	ME6701	**Course Title**	Power Plant Engineering			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year	III	**Semester/ Section**	V / A&B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Name the various binary vapour cycles?	C303.1	U
2	Why majority of coal based thermal power plants are located near seashore?	C303.1	U
3	What is pulveriser and why it is used?	C303.1	U
4	How the Rankine cycle efficiency can be improved?	C303.1	R
5	What are the essential components of gas power plant?	C303.2	U
6	What is called compression ratio.	C303.2	R
7	List out the coolant used in gas cooled reactor.	C303.3	U
8	How do you cater for safety of nuclear power plant?	C303.3	R
9	Give typical examples for control rods.	C303.3	U
10	Name the combinations of fuel and moderator?	C303.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	With neat diagram explain the fast breeder reactor and also mention its advantages.	C303.3	R &U
11 b	Discuss about the safety measures adopted in modern nuclear plants.	C303.3	R &U
	Or		
12	Explain CANDU reactor with neat diagram and also mention its merits and demerits.	C303.3	R &U
13	List the types of gas turbine power plant and explain in detail with neat diagram.	C303.2	R&U
	Or		
14 a	Draw the flow diagram of Otto cycle and derive its air standard cycle efficiency..	C303.2	R&U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Draw a general layout of steam power plant with neat diagram and explain the working of different circuits.	C303.1	R &U
	Or		
16.	A steam power plant operates between a boiler saturation temperature of180°C and condenser temperature of 45°C. Dry saturated steam enters the turbine. Draw the T-s diagram; calculate the Rankine cycle efficiency and specific steam consumption (SSC). Use the data below:	C303.1	U&AZ

T	P	V_f	Vs	s_f	s_{fg}	s_g	h_f	h_{fg}	h_g
°C	kPa	m^3/kg		kJ/kg.K			kJ/kg		
45	95.8	0.0010	15.28	0.638	7.515	8.163	188	2394	2582
180	1000.0	0.0011	0.1944	2.14	4.45	6.59	763	2015	2778

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Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Faculty name : Dr.S.Tamilarasan & N.Saranya

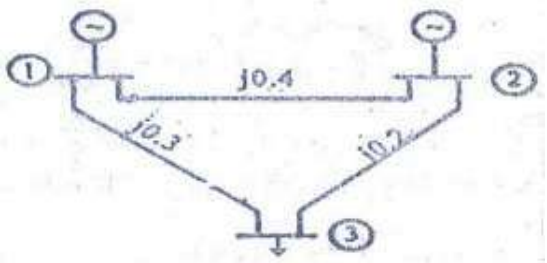
Saranathan College of Engineering
Tiruchirapalli

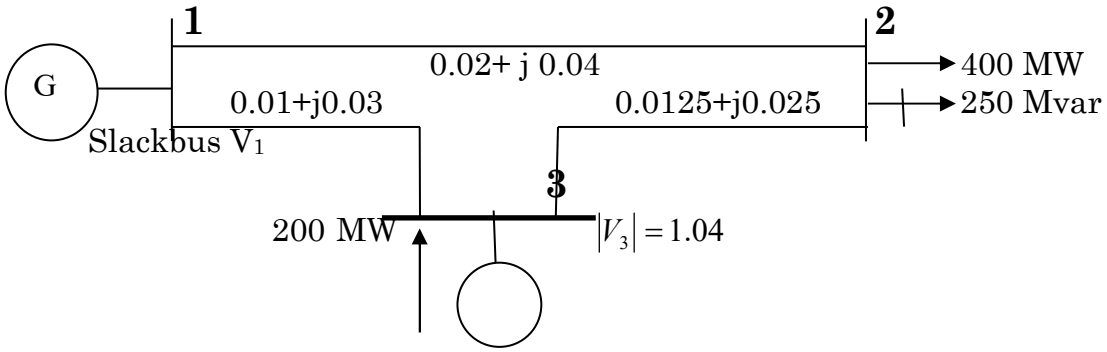
Internal Assessment Test - II			Date/Session	27.08.18/AN	Marks	50
Course code	EE6501	Course Title	POWER SYSTEM ANALYSIS			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	III	Semester/Section	V/A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

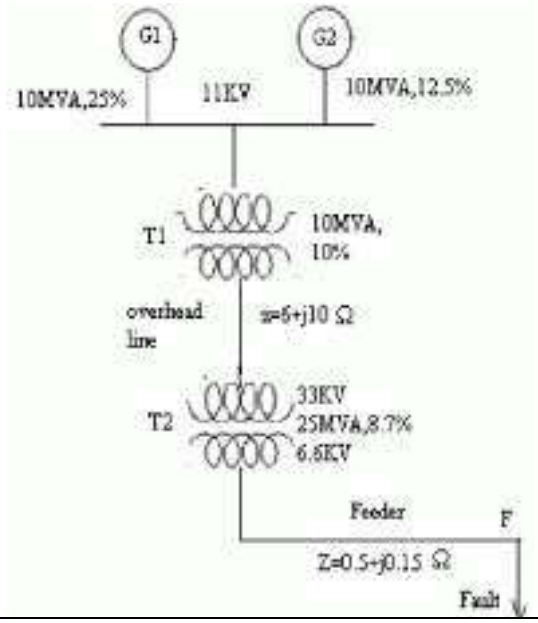
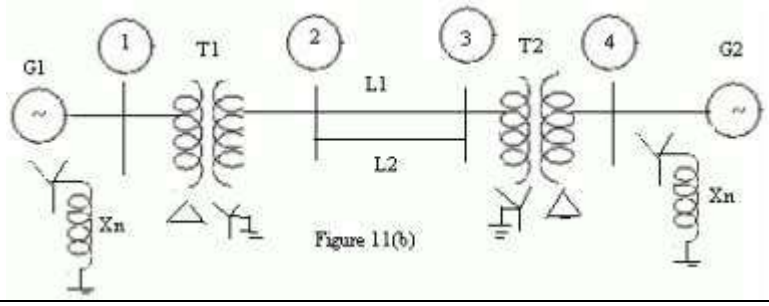
Q. No.	Questions	CO	Skills
1	Explain the significance of Acceleration factor in load flow solution.	C301.2	U
2	What is the reason for quick convergence of N-R method compared to G-S method?	C301.2	A
3	What is meant by a flat voltage start?	C301.2	R
4	List down merits and demerits of G-S and N-R methods.	C301.2	E
5	What are the different types of unbalanced fault?	C301.3	R
6	What is meant by bolted fault?	C301.3	R
7	Explain why short circuit study is to be done.	C301.3	A
8	Classify the faults that occur in a power system.	C301.3	R
9	Define short circuit capacity(SCC) of power system	C301.3	U
10	Explain how balanced faults are analysed using Thevenin's theorem.	C301.3	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Fig shown below a three bus system Bus 1:slack bus V=1.05∟0 p.u. Bus 2:PV bus | V |=1.04 p.u, Pe=2 p.u.Bus 3:PQ bus P_L=3 p.u,Q_L=1p.u. examine one iteration of load flow solution by Guass seidel method.neglact limits on reactive power generation? 	C301.2	AZ
	Or		
12	Derive G-S method of load flow algorithm and explain the implementation of this algorithm with the flowchart.	C301.2	E
13	Derive N-R method of load flow algorithm and explain the implementation of this algorithm with the flowchart.	C301.2	U
	Or		

14	Figure shows the one-line diagram of a simple three-bus power system with generation at bus 1. The voltage at bus 1 is $1.0\angle 0^{\circ}$ per- unit. The scheduled loads on buses 2 and 3 are marked on the diagram. Line impedances are marked in per-unit on a 100-MVA base. The line resistances and line charging susceptances are neglected. Execute the first iteration of load flow solution using G-S method.  	C301 .2	E

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	For the radial network shown in figure , a 3 phase fault occurs at point F. examine the fault current.  	C301.3	AZ
	or		
16	A symmetrical fault occurs on bus 4 of system shown in figure; examine the fault current, post fault voltages, line flows. Generator G1 ,G2 :100MVA,20KV,X1=10%. Transformer T1, T2:, Xleak=5%, Transmission line L1,L2: X1=15%  	C301.3	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Staff In Charge: Dr.M.V.Suganyadevi,ASP/EEE
Mr.B.Paranthagan, ASP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II				Date/Session	27-08-18/FN	Marks	50
Course code	EE6503	Course Title	POWER ELECTRONICS				
Batch No.		Duration	90 mins	Academic Year		2018 - 2019	
Year	III	Semester/Section	V / A & B	Department		EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the classifications of 3 phase controlled rectifier?	C304.2	R
2	Draw the circuit diagram of a 3 phase half wave controlled rectifier?	C304.2	R
3	What are the advantages and disadvantages of ac voltage controller?	C304.5	U
4	What is meant by duty cycle in ON-OFF control method?	C304.5	U
5	What is Phase control?	C304.5	A
6	Differentiate phase control and sequence control of ac voltage controllers.	C304.5	AZ
7	What are the classifications of cycloconverter based on circuit configuration?	C304.6	R
8	What is a step up cycloconverter?	C304.6	A
9	What type commutation is needed in step up cycloconverter?	C304.6	A
10	What is meant by positive group converter?	C304.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the working of a 3 phase full converter with R load for continuous conduction. Derive for average output voltage.	C304.2	R
	Or		
12	Explain the operation of three phase 3 pulse converter with RL load. Derive for average output voltage.	C304.2	R
13 a	A 230V 50Hz ac supply is given to an R load (25Ω) through an ac voltage controller. Find Vo-rms for α=90degree and β=210degree	C304.5	E
13 b	Explain the operation of single phase full wave AC voltage regulator feeding RL load with help of voltage and current waveform.	C304.5	A
	Or		
14	Discuss the working of a single phase ac voltage controller with RL load. What is the need for continuous gating signal?	C304.5	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss the working of a three phase to single phase cyclo-converter with neat voltage waveform.	C304.6	A
	Or		
16	Explain the operation of a single phase bridge type step up cycloconverter feeding a resistive load. Draw the voltage and current waveforms for fo =3f_s.	C304.6	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge: S.Ram Prasath / AP /EEE & R.Balasubramanian / Asso.Prof. / EEE

Saranathan College of Engineering

Tiruchirapalli-12

Internal Assessment Test - II			Date/ Session	28-8-18/FN	Marks	50
Course code	EE6504	Course Title	Electrical Machines-II			
Batch No.		Duration	90 minutes	Academic Year	2018 - 2019	
Year	III	Semester/ Section	V/ A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is meant by synchronous condenser?	C305.2	U
2	What are the effects and causes of hunting in synchronous motor?	C305.2	U
3	When is a synchronous motor said to be under-excited? what will be the p.f at this condition?	C305.2	A
4	What are the two fundamental characteristics of a rotating magnetic field?	C305.3	U
5	Define the term slip and synchronous speed of an induction motor.	C305.3	R
6	Why slots on the rotor of induction motor are skewed?	C305.3	U
7	How do you reverse the direction of rotation of a 3-phase induction motor?	C305.3	R
8	A 12 pole, 3-phase alternator is coupled to an engine running at 500 rpm. It supplies an induction motor which has a full-load speed of 1440 rpm. Find the slip of the motor.	C305.3	E
9	What is the relationship between frequency of stator current and rotor current of an induction motor?	C305.3	AZ
10	What are the applications of 3-phase induction motor?	C305.3	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Draw the V and Inverted V –curves and explain the effect of excitation on armature current and power factor of synchronous motor	C305.2	U
11 b	A 75 kW, 400 V, 4 pole, 3-phase , star connected synchronous motor has a resistance and synchronous reactance per phase of 0.04Ω and 0.4Ω respectively. Compute for full load 0.8 p.f lead the open circuit emf per phase and gross mechanical power developed. Assume an efficiency of 92.5%	C305.2	E
	or		
12	Show that the locus of stator current for a constant mechanical power developed of 3-phase synchronous motor connected to a constant voltage, constant frequency bus bars is circle.	C305.2	C

Q. No.	Questions	CO	Skills
13.a	Describe the constructional features of both squirrel cage and slip ring induction motor. Discuss the merits of one over another	C305.3	R
13.b	Describe the principle operation of a 3-phase induction motor. Explain why the rotor is forced to rotate in the direction of rotating magnetic field. What is happened if synchronous speed is equal to rotor speed?	C305.3	U
	or		
14	Derive the expressions for Torque under running conditions, condition for maximum torque and condition for maximum starting torque in a 3 phase induction motor.	C305.3	A

PART-C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A 1100V, 50 Hz delta connected induction motor has a star connected slip rings rotor with a phase transformation ratio of 3.8(stator/Rotor). The rotor resistance and standstill leakage reactance are 0.012 and 0.25 per phase respectively. Neglecting stator impedance and magnetizing current determine. (i) rotor current at start with slip-ring shorted (ii) the rotor power factor at start with slip-rings shorted (iii) the rotor current at 4% slip with slip ring shorted (iv) The rotor power factor at 4% slip with slip ring shorted (v) the external rotor resistance per phase required to obtain a starting current of 100A in the stator supply lines.	C305.3	E
	or		
16	A 6-pole, 50Hz, 3-phase induction motor has a rotor resistance of 0.25 per phase and a maximum torque of 10 N-m at 875 rpm. Calculate (a) the torque when the slip is 5%, and (b) the resistance to be added to the rotor circuit to obtain 60% of the maximum torque at starting. Explain why two values are obtained for this resistance. Which value will be used? The stator impedance is assumed to be negligible.	C305.3	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Faculty Incharge: Mr.P.Ramesh Babu & Mr. P.K.Arun Kumar

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/Session	28/8/2018/FN	Marks	50
Course code	EE8353	Course Title	ELECTRICAL DRIVES AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2018 – 2019	
Year/	II	Semester/Section	III/A&B	Department	MECH	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is the difference between electrical and mechanical braking?	205.2	U
2	Explain the dynamic braking of induction motor.	205.2	U
3	What are the protective coils used in DC starters and explain its functions.	205.3	R
4	Define slip and synchronous speed.	205.2	E
5	Why a single-phase induction motor cannot self-start?	205.2	U
6	Why is starter necessary for a DC motor?	205.3	U
7	What are the advantages of 4-point starter over 3-point starter?	205.3	U
8	Is it possible to include/exclude external resistance in the rotor of a squirrel cage induction motor? Justify.	205.3	U
9	Explain rotor resistance starter allows fast start with heating of induction motor.	205.3	U
10	What are the types of speed control methods of DC series motor?	205.2	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	With a neat diagram explain the types of AC starters.(Any 3)	205.3	A
	Or		
12	Explain why 4 point starter is preferred over 3 point starter. (10)	205.3	U
13	Explain the types of braking in AC motors.	205.2	E
	or		
14	Explain the types of electrical braking in DC motors (10)	205.2	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A 460V series motor runs at 500 rpm taking a current of 40A ,calculate the speed and percentage change in torque if the load is reduced so that the motor is taking 30A,total resistance of the armature and field circuit is 0.8Ω.Assume flux is proportional to the field current.	205.2	U
	Or		
16	Derive from the basis, the torque developed in a three-phase induction motor. Draw the torque-slip characteristics. Also derive the conditions for maximum torque. What is the effect of changing rotor resistance on torque-slip characteristics. (10)	205.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty In-charge : Section'A- Mr.R.Vijay AP/EEE ; Section'B- Ms.N.Karthika AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	27.08.2018/FN	Marks	50
Course code	EE6005	Course Title	POWER QUALITY			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	IV	Semester/ Section	VII / B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What are the types of transient voltages?	C405E4.3	A
2.	Give examples of oscillatory transient voltages	C405E4.3	R
3.	How Overvoltages are induced due to lightning?	C405E4.3	R
4.	.What is the need of low pass filter in transient protection?	C405E4.3	R
5.	Write down atleast four internal causes of over voltage	C405E4.3	E
6.	What is the need of PSCAD/EMTDC?	C405E4.3	R
7.	RMS value of third harmonic current in a non-linear load is 20 amps, the RMS value of fifth harmonic current is 15 amps and the RMS value of fundamental is 60 amps. Estimate the RMS value of the distorted waveform	C405E4.4	AZ
8.	Define Harmonics	C405E4.4	R
9.	What are the two most commonly used harmonic indices?	C405E4.4	U
10.	Define the Total Demand Distortion	C405E4.4	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Explain Ferro resonance phenomenon and its indicators	C405E4.3	AZ
	OR		
12.	What are the different sources of transient over voltages? Discuss the capacitor switching transient	C405E4.3	U
13.	Discuss different methods of protection of transformers and cables against over voltages	C405E4.3	U, A
	OR		
14.	What are the advantages of computer analysis tools? Discuss about PSCAD and EMTP for transient studies	C405E4.3	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Explain the methods to evaluate harmonic distortion and devices to control	C405E4.4	U
	OR		
16.	Write short note on the active filter and passive filter in controlling harmonic distortion	C405E4.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/Session	29-08-18/FN	Marks	50
Course code	EE6008	Course Title	MICROCONTROLLER BASED SYSTEM DESIGN			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/Section	VII / 'A & B'	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Differentiate between bus operation and bus subroutine	C406.3	R
2	Define baud rate	C406.3	U
3	List out registers associated with UART	C406.3	R
4	What is the value to be loaded into SPBRG register if we want 19200 Baud rate with 10 MHZ clock source.	C406.3	E
5	Microcontroller based control is more advantageous than conventional control - Justify	C406.3	R
6	How temperature sensor is interfaced with PIC Microcontroller?	C406.3	U
7	What are the various elements of UART?	C406.3	U
8	What is accuracy in DAC?	C406.3	U
9	List the various registers used in A/D conversion.	C406.3	U
10	What is the role of master and slave operation performed by the I2C?	C406.3	E

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Exhibit the operation I2C bus and develop embedded C program to transmit data using I2C bus.	C406.3	U
	or		
12	Explain the PIC interfacing with peripherals that includes ADCs with timer and sensors.	C406.3	U
13	Explain the process and procedure to display constant strings and variable strings.	C406.2	A
	or		
14	Explain the Key switch subroutine algorithm with neat flowchart. Also illustrate programming examples.	C406.2	A
15	Explain briefly about various operation performed by EEPROM chip.	C406.3	U
	or		
16	Explain the features and operation of UART in PIC 16CXX microcontroller.	C406.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Staff In-Charge : Dr.S.Vijayalakshmi/Asso. Prof/EEE, B.Paranthagan Asso. Prof./EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/Session	29.8.2018/AN	Marks	50
Course code	EE6701	Course Title	HIGH VOLTAGE ENGINEERING			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	IV	Semester/Section	VII /	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write the equation for optimum number of stages in Cockcroft Walton Voltage multiplier circuit.	C401.3	R
2	Define the standard impulse wave	C401.3	U
3	What are the components of multi-stage impulse generator?	C401.3	A
4	What are the advantages of resonant transformers?	C401.3	U
5	Define front time.	C401.3	U
6	What are the methods to measure DC voltages?	C401.4	AZ
7	What do you mean by CVT?	C401.4	AZ
8	Define Generating voltmeter and Hall Voltage	C401.4	U
9	What is the principle used in electrostatic voltmeter?	C401.4	U
10	How is the resistance shunt designed?	C401.4	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Obtain the expression for voltage ripple, voltage drop and optimum number of stages in a Cockroft-Walton voltage multiplier circuit for generation of high DC voltages.	C401.3	AZ
	Or		
12	Discuss elaborately the principle and operation of Cascaded transformers for generating high AC voltages	C401.3	U
13	Explain the following methods for measurement of High AC Voltages at power frequency i. Series impedance ammeter ii. Electrostatic voltmeter	C401.4	U
	Or		
14	Explain with neat sketch, measurement of High DC current using resistive shunt and hall generator.	C401.4	U

Part – C
(Answer all the questions 1 x 10 = 10marks)

15	With a neat circuit and phasor diagram, explain the Capacitance Voltage Transformer	C401.4	A
	Or		
16	Explain the parameters and factors that influence the sphere gap in voltage measurements.	C401.4	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

FACULTY : Mr.R.SATHEESH AND Mr.S.SIVAKUMAR

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II				Date/Session	27.08.2018/ AN	Marks	50
Course code	EE6702	Course Title	Protection and Switchgear				
Batch No.		Duration	90 mins	Academic Year	2018 - 2019		
Year	IV	Semester/Section	VII / A & B	Department	EEE		

Part – A
(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	List the application of current transformer and potential transformer.	C407.3	R
2	Define the term pilot with reference to power line.	C407.3	R
3	Explain over fluxing protection of a transformer?	C407.3	U
4	Discuss the type of relays are used to protect transmission.	C407.3	U
5	Explain time-graded system protection?	C407.3	U
6	Write the advantages, disadvantages and applications of static relays.	C407.4	R
7	Draw block diagram of numerical relays.	C407.4	R
8	List the different methods of numerical distance protection of transmission lines.	C407.4	R
9	Show the duality between amplitude and phase comparators.	C407.4	U
10	What are the different types of static relays?	C407.4	U

Part – B
(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Explain the protective scheme employed for the bus bar with relevant diagram.	C407.3	U
	Or		
12	Classify different protection schemes normally used for protection of a power transformer from internal faults? Discuss one of them in brief.	C407.3	U
13	Explain the use of impedance relay on transmission line protection.	C407.3	U
	Or		
14	Describe the types of protective schemes employed for the protection of field winding and loss of excitation of an alternator.	C407.3	U

Part – C
(Answer all the questions 1 x 10 = 10 marks)

15	Discuss the synthesis of various distance relays using static comparators.	C407.4	U
	Or		
16	Explain with neat block diagram about the functions of numerical relay for the protection of transformer.	C407.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Incharge: Dr.C.Krishnakumar, Prof & HoD/EEE and P.K.Arun Kumar, AP/EEE

Saranathan College of Engineering

Tiruchirappalli

Internal Assessment Test - II			Date/ Session	28/08/2018 / AN	Marks	50
Course code	EE6703	**Course Title**	SPECIAL ELECTRICAL MACHINES			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year	IV	**Semester/ Section**	VII / A&B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is stepper motor?	C403.2	U
2	Mention any 5 applications of stepper motor	C403.2	U
3	What is meant by micro stepping in stepper motor?	C403.2	U
4	List the types of windings used in Stepper Motor.	C403.2	R
5	What are the different modes of excitation in a Stepper Motor.	C403.2	U
6	A variable reluctance Stepper Motor has 8 poles in the stator and they have 5 teeth in each pole. If the rotor has 50 teeth, Calculate the Step angle and also Resolution.	C403.2	E
7	Differentiate between VR and PM Stepper Motor.	C403.2	A
8	Define synchronism in stepper motor.	C403.3	R
9	Draw the Block diagram of Microprocessor based Closed loop system of Stepper Motor	C403.3	R
10	List the types of Current Suppressor circuits.	C403.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the construction and various modes of excitation of Single stack VR stepper motor.	C403.2	U
	or		
12	Explain the construction and working principle of Hybrid stepper motor.	C403.2	U
13	Explain the static and dynamic characteristics of a stepper motor.	C403.3	U
	or		
14	Describe in detail about the power drive circuits for stepper motor and Explain any 2 types.	C403.3	R,U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Describe the hysterisis type and PWM type current regulator for one phase of a SRM.	C403.4	R
	or		
16	Explain the Microprocessor based control of SRM drive.	C403.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE & Ms.K.Gaayathry AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	28.08.18/ FN	Marks	50
Course code	PX5072	**Course Title**	Power Electronics for Renewable Energy Systems			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year	II	**Semester/ Section**	III	**Department**	M.E.-PED	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is the need of active crowbar in DFIG?	C201.2	A
2	Enlist the wind turbine used for domestic application.	C201.2	U
3	Draw the Equivalent circuit model of PMSG	C201.2	R
4	Why are induction generators preferred over DC generators in WECS	C201.2	AZ
5	How to assess the wind energy pattern for a particular location	C201.2	U
6	What is a grid interactive inverter? State its significance.	C201.3	U
7	What are the factors to be considered for the selection of batteries for solar energy conversion system?	C201.3	R
8	A battery rating at 0.2C is 50 Ah @ 25°C. What would happen to the battery if it is discharge at the rate of 0.1C under the ambient temperature of 10°C	C201.3	A
9	Specify about power conversion ratio.	C201.3	R
10	Define inversion mode in line commutated inverters	C201.3	AZ

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
1 a	Using the schematic explain the working of doubly fed induction generator.	C201.2	E
1 b	Distinguish between induction and synchronous generator	C201.2	U
	or		
2	Explain the modeling and control of PMSG based variable speed wind turbine	C201.2	E
3	Discuss in detail the grid system characteristics and explain with neat diagram the stand alone and grid integrated solar system	C201.3	AZ
	or		
4 a	Draw and explain the equivalent circuit of PV module	C201.3	U
4 b	Write a short note on battery sizing	C201.3	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
5	Design a converter to interface PV module to the grid and extract the maximum power from it.	C201.3	C
	or		
6	Show how a DC-DC converter can be used as a part of an inverter designed to have a square wave output of 48V with a 12V dc input. The idea is to design the inverter without transformer. Sketch a block diagram, showing design components to clearly express your design	C201.2	C

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	27.08.2018 /FN	Marks	50
Course code	PS5072	Course Title	Solar and Energy Storage Systems			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/ Section	III	Department	PED	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is Islanding?	C202.3	R
2	List the module mounting approaches?	C202.3	R
3	State the significance of roof top domestic solar power system.	C202.3	R
4	What is capacity credit and energy credit?	C202.3	E
5	What is array arching? How it can be prevented?	C202.3	E
6	Mention the solar PV programs initiatives in india.	C202.4	E
7	What are the advantages and disadvantages of solar thermal energy storage system?	C202.4	R
8	What is latent heat storage and sensible heat storage?	C202.4	A,R
9	What is pumped energy storage systems.	C202.4	A,R
10	Define intermittent power.	C202.4	A,R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Write brief notes on integration of PV in buildings.	C202.3	E
11 b	Explain the economic aspects of PV system.	C202.3	E
	or		
12	Discuss about the issues addressed during grid tied solar power.	C202.3	E
13	Explain the need, types and constructional details of solar thermal energy storage system.	C202.4	E
	or		
14	Explain working of the pumped hydroelectric energy storage system.	C202.4	E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Analyze the efficiency and performance of a PV system in grid connected systems.	C202.3	A
	or		
16	Explain about any three international PV programs in existence and its development.	C202.3	A

Staff Incharge: V.Ajitha /AP/EEE

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/ Session	27.09.2018/ AN	Marks	50
Course code	EC8353	Course Title	Electron Devices And Circuits			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write a note on need of feedback.	C205.5	U
2	Define – negative feedback.	C205.5	AZ
3	Draw the block diagram for current shunt feedback.	C205.5	R
4	What is Barkhausen criterion for oscillations?	C205.6	R
5	Draw the circuit diagram of Wien bridge oscillators.	C205.6	U
6	Write short notes on resonant frequency of crystal oscillators.	C205.6	R
7	Define – Differential amplifier.	C205.4	E
8	Draw the neat sketch of differential amplifier	C205.4	U
9	Write the expression for general equation of oscillators.	C205.4	R
10	Write expression for differential mode gain.	C205.4	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the working of differential amplifier and derive expression for Q point for transistor by AC analysis and also define CMRR.	C205.4	U
	Or		
12	With neat diagram, discuss the working principle of cascade amplifier	C205.4	R &U
13	Explain in detail about the working of any two types of feedback system	C205.5	R&U
	Or		
14	Derive the expression for voltage gain, input and output resistance for voltage series and current shunt feedback system	C205.5	R&U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	With neat circuit diagram, explain the working of phase shift oscillators using FET as amplifier, also derive expression for resonant frequency and condition for sustained oscillation	C205.6	R &U
	Or		
16	With neat diagram, explain the working of Hartley and Colpitt's oscillators, also derive expression for resonant frequency and h_{fe}	C205.6	R &U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Course handling faculties
Dr. S. Thamizharasan, Asso.Prof/ EEE
Mr. R. Venugopal, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – III Set-2			Date/Session	29.9.18/FN	Marks	50
Course code	EE8301	Course Title	ELECTRICAL MACHINES -I			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is retentivity?	204.2	R
2	Why transformer rated in VA?	204.2	U
3	What are the conditions which satisfies an ideal Transformer?	204.2	R
4	Differentiate between statically and dynamically induced emf.	204.3	R
5	What is Stacking factor?	204.3	R
6	State the emf equation of a transformer.	204.2	U
7	Explain the term transformation ratio with its formula.	204.2	R
8	Differentiate between core and shell type of a transformer.	204.3	AZ
9	Define coercive force.	204.3	R
10.	A coil of 1500 turns carrying a current of 5 Amps produce a flux of 2.5 mWb. Find the self inductance of the coil.	204.3	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Draw the B-H curve and discuss in detail the B-H relationship..	204.2	U
	or		
12	What are the losses of a transformer and show that the maximum efficiency in a transformer occurs when its variable loss equal to constant loss.	204.2	A
13	Draw a phasor diagram to represent conditions in a single phase transformer supplying load at 1.UPF,2.Lagging PF,3.Leading PF.	204.3	AZ
	or		
14	The emf per turn of a single phase ,6.6 KV,440V,50Hz transformer is approximately 12 V.Calculate the no of turns in the HV & LV Windings and the net cross sectional area of the core for a maximum flux density of 1.5 T	204.3	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Derive the equivalent circuit of a single phase 2 winding transformer.	204.3	A
	or		
16	Calculate the efficiency at half, Full load of a 100 KVA transformer for power factor of unity and 0.8.The copper loss is 1000W at full load and iron loss is 1000W.	204.3	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: P.Pushpa,AP/EEE & R.Vijay, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	28.09.2018/FN	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the two types of asynchronous sequential circuit and compare?	C201.4	R,U
2	Define races in asynchronous sequential circuit	C201.4	R,A
3	Define transition and flow table in asynchronous sequential circuit.	C201.4	R,U
4	What is static hazard and dynamic hazard.	C201.4	R,U
5	List the configurable elements in FPGA architecture.	C201.5	R,U
6	State the difference between PROM, PLA & PAL.	C201.5	R,A
7	Define propagation delay.	C201.1	R
8	Sketch the circuit diagram of a two input DTL NAND gate.	C201.1	R
9	Define noise margin.	C201.1	R
10	Define fan-in and fan-out.	C201.1	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain the types of hazards and the methods to eliminate them. (5)	C201.4	A
11 b	Explain the steps used for analyzing an asynchronous sequential circuit.(5)	C201.4	A
	or		
12	Design an asynchronous sequential circuit that has two inputs X_2 and X_1 and one output Z. The output is to remain 0, as long as X_1 is a 0. The first change in X_2 that occurs while X_1 is a 1 will cause Z to be a 1. Z is to remain in a 1 until X_1 returns to zero.	C201.4	AZ
13	Explain with an aid of circuit diagram the operation of CMOS NAND & NOR and list out its advantages over other logic families.	C201.1	U,AZ
	or		
14	With circuit schematic, explain the operation of a 2 input and 3 input TTL NAND gate with totem pole output.(7) Write short notes on RTL.(3)	C201.1	U,E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Show how to program the fusible links to get a 4 bit gray code from the binary inputs using PAL & compare the design requirements with PROM.	C201.5	AZ
	or		
16	Design a PLA & PAL using AND and OR logic for the following functions. F1=∑m(0,1,2,3,4,7,8,11,12,15) F2=∑m(2,3,6,7,8,9,12,13) F3=∑m (1,3,7,8,11,12,15) F4=∑m (0,1,4,8,11,12,15)	C201.5	AZ

Staff Incharge: V.Ajitha /AP/EEE, Dr.S. Vijayalakshmi / Asso. Prof/EEE

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/ Session	28-9-18/ AN	Marks	50
Course code	EE8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Lenz law.	C203.5	R
2	State Faraday's law	C203.5	R
3	Distinguish between conduction and displacement currents.	C203.5	R
4	Distinguish between transformer emf and motional emf	C203.5	R
5	Give the characteristic impedance of free space.	C203.6	R
6	Define propagation constant.	C203.6	R
7	Define intrinsic impedance or characteristic impedance.	C203.6	R
8	Define skin depth.	C203.6	R
9	Mention the properties of uniform plane waves.	C203.6	R
10	Define pointing vector.	C203.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	With necessary explanation, derive the set of Maxwell's equation in differential and integral forms	C203.5	R
	or		
12	Define faraday's law. What are the different ways of emf generation? Explain with the governing equations and suitable example for each.	C203.5	R
13	Derive the equation for electromagnetic waves in Free space	C203.6	R
	or		
14	Derive the expressions describing the propagation of uniform plane waves in a lossy dielectric medium	C203.6	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	State Poynting theorem and thus obtain an expression for instantaneous power density vector associated with electromagnetic field.	C203.6	R
	or		
16	Show that the total power flow along a coaxial cable will be given by the surface integration of the Poynting vector over any closed surface.	C203.6	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Name of the faculty : P. Magdelin Jennifer Princy & N. Gayathri

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III			Date/ Session	29.09.2018/ AN	Marks	50
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/ Sec	III/A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define the term connected load.	C206.5	R
2	What are the major factors that decide the economics of power plant?	C206.5	U
3	What is ESP? State its use.	C206.5	R&U
4	What are the methods used for controlling the NO_x ?	C206.5	U
5	Define two part tariff.	C206.6	R
6	What is the significance of three part tariff?	C206.6	A
7	What are fixed and operating costs?	C206.6	U
8	What is combined power cycle? Give examples.	C206.2	R & A
9	What are the advantages of IGCC?	C206.2	A
10	What are the main units in gas turbine power plant?	C206.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Discuss the working of i. Gas Turbine-Steam Turbine Combined Cycle Power Plant **(4 Marks)** ii. Thermionic-Steam Combined Cycle Power Plant **(3 Marks)** iii. MHD-Gas Turbine Combined Cycle Power Plant **(3 Marks)**	C206.2	R&U
	Or		
12	i. Explain in detail about the construction and working of IGCC **(7 Marks)** ii. List the advantages of Combined Cycles **(3 Marks)**	C206.2	R&U
13	Explain the methods to control pollution in thermal and nuclear power plant	C206.5	R&U
	Or		
14	Explain site selection criterion of hydro electric power plant and nuclear power plant	C206.5	R&U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	i. A generating station supplies 4 feeders with maximum demands of 16MW, 10MW, 12MW and 7MW. The overall maximum demand of the station is 20MW and annual load factor is 45%. Calculate the number of units generated annually and the diversity factor. **(5 Marks)** ii. Elucidate the objectives and requirements to tariff and general form of tariff. **(5 Marks)**	C206.6	U& AZ
	Or		
16	i. A residential consumer has 10 lamps of 40W each. The demand is shown below Midnight to 5am – 40W 5am to 6pm – no load 6pm to 7pm – 329W 7pm to 9pm – 360W 9pm to midnight – 160W Plot the load curve. Find the average load, maximum load and demand factor. **(5 Marks)** ii. Define Demand Factor, Load factor, Diversity Factor, Plant Capacity Factor and Reserve Factor. **(5 Marks)**	C206.6	U,AZ & R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Name of faculty: R.Balasubramanian & A.R.Danila Shirly

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – III			Date/Session	29-09-18 / AN	Marks	50
Course code	IC6501	Course Title	CONTROL SYSTEMS			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	III	Semester/Section	05 / A & B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State about lag-lead compensation.	C306.4	R
2	What is characteristic equation?	C306.4	AZ
3	What are the effects of adding open loop poles and Zero on the nature of the root locus and on system	C306.4	R
4	Give the need for lag / lag – lead compensation.	C306.4	AZ
5	What are the necessary conditions for stability?	C306.4	U
6	Define nyquist stability criterion.	C306.4	U
7	Define state trajectory	C306.5	R
8	Draw the block diagram representation of a state model.	C306.5	R
9	State the limitations of state variable feedback.	C306.5	R
10	Write the homogeneous and non homogeneous state equation.	C306.5	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Realize the basic compensators using electrical network (lag, lead, and lag-lead) and obtain the transfer function.	C306.4	E
	(OR)		
12	The open loop transfer function of a unity feedback system is given by G(S) = $\frac{K}{(S+2)(S+4)(S^2+6S+25)}$. By applying the routh criterion, discuss the stability of the closed loop system as a function of K. determine the value of K which will cause sustained oscillations in the closed loop system. What are the corresponding oscillating frequencies?	C306.4	AZ
13	Write down the design procedure for designing lag compensator using bode plot.	C306.4	E
	(OR)		
14	Design a lead compensator for a unity feedback system with an open loop transfer function G(S) = $\frac{K}{S(S+1)}$ for the given specifications of Kv = 10 sec^{-1} and phase margin $\gamma = 35^0$.	C306.4	E
	PART – C **(Answer all the questions 1 x 10 = 10marks)**		
15	Consider the matrix A. Compute e^{At} by two methods. A = $\begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$	C306.6	C
	(OR)		
16	Explain the concepts of controllability and observability.	C306.6	C

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty name: M.Marimuthu (A-sec), N.Vijayasarathi (B-sec)

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	29.09.2018 /FN	Marks	50
Course code	ME6701	Course Title	Power Plant Engineering			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	III	Semester/ Section	V/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is meant by super critical boilers?	C303.1	U
2	Name the various vapor cycles.	C303.1	U
3	What is pulverize and why it is used?	C303.1	U
4	Write the difference between open cycle and closed cycle of gas power plant.	C303.2	R
5	Draw the PV and TS diagram of the Brayton cycle.	C303.2	U
6	List out the essential components of diesel power plant?	C303.2	R
7	Write the types of combined cycle power plant?	C303.2	U
8	Define air standard efficiency.	C303.2	R
9	What is the significance of load curve?	C303.5	U
10	Define plant use factor.	C303.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain the process of Diesel cycle and derive its efficiency.	C303.2	U
	Or		
12	Explain in detail about the construction and working of Integrated Gasifier based Combined Cycle system.	C303.2	R &U
13	List various pollutants released by the coal based thermal power plant and explain the methods to mitigate them.	C303.5	R&U
	Or		
14 a	Elucidate the objectives and requirements of tariff and explain all types of tariff with suitable examples.	C303.5	R&U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain with neat sketch the working of thermal electric power plant station and discuss the function of major components in it.	C303.1	R &U
	Or		
16.	Write short notes on the following subsystems of thermal power plant i) Fuel handling system ii) Ash handling system	C303.1	R &U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Name of the Faculty: Dr. S. Thamizharasan, Assoc.Prof./EEE
Ms. N.Saranya, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/Session	27.09.18/FN	Marks	50
Course code	EE6501	Course Title	POWER SYSTEM ANALYSIS			
Batch No.	183	Duration	90 mins	Academic Year	2018 - 2019	
Year/	III	Semester/Section	V/A&B	Department	EEE	

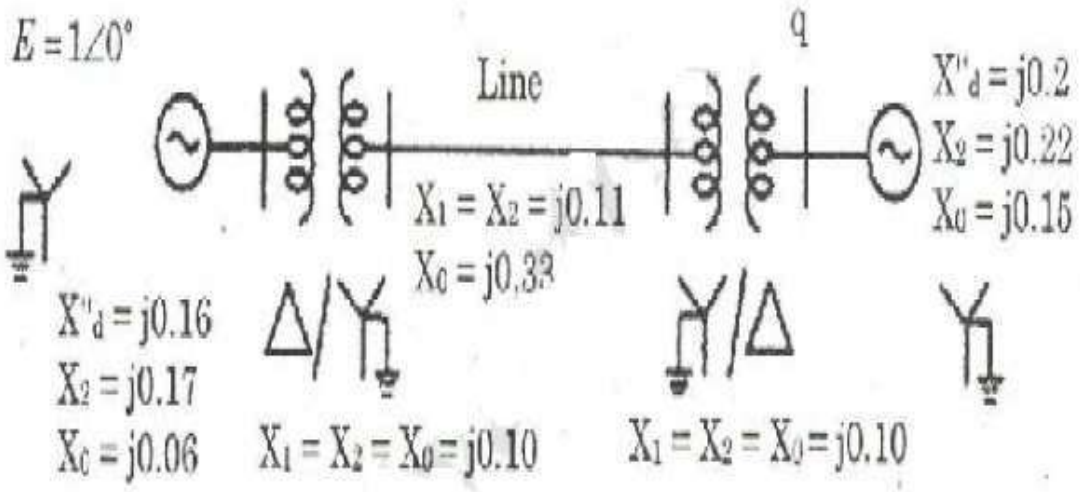
Part – A

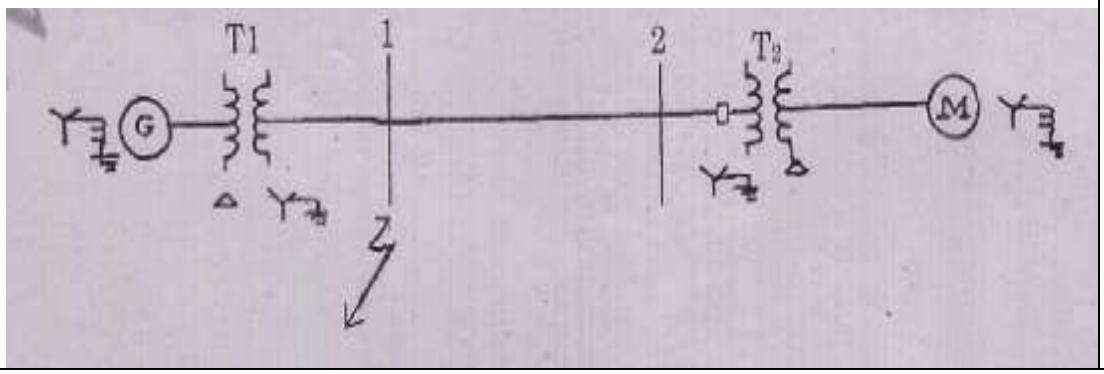
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Express the symmetrical components Va1, Va2 and Va0 in terms of unbalanced vectors Va, Vb and Vc.	C301.4	E,R
2	Explain the features of zero sequence current?	C301.4	A
3	Define doubling effect and DC off-set current	C301.4	R
4	Define short circuit capacity	C301.4	E,A
5	Differentiate between subtransient and transient reactance	C301.4	AZ
6	What is an unsymmetrical fault? List the various unsymmetrical faults	C301.4	R
7	Define Voltage Collapse	C301.5	R
8	How to improve the transient stability limit of power system?	C301.5	AZ
9	Classify steady state stability limit. Define them	C301.5	U
10	Define swing curve. What is the use of swing curve?	C301.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Discuss the expression for fault current in single line to ground fault on unloaded generator. Draw an equivalent network showing the inter connection of networks to simulate single line to ground fault	C301.4	R
	or		
12	Calculate the sub transient current in each phase for a dead short circuit on the one phase to ground at bus 'q' for the system shown in figure below. 	C301.4	E
13	Show the expression for fault current in line to line fault on unloaded generator. Draw an equivalent network showing the interconnection of	C301.4	R

	networks to simulate double line to line fault.		
	or		
14	**A single line to ground fault occurs on the bus 1 of the system of Fig shown below. Find** **(1) Current in the Fault** **(2) SC current in phase a of generator** **Given rating of the each machine 1200 KVA, 600V with X1=X2=10%, X0=5% each three phase transformwer is rated 1200 KVA,600/3300 V (Delta-Star) with leakage reactance of 5% the reactance of the transmission line are X1=X2=20% and X0=40% on a base of 1200 KVA,3300V the reactance's of the neautral grounding reactors are 5% on the KVA and voltage base of the machine.** 	**C301.4**	**E**

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	**Derive the swing equation for a single machine connected to infinite bus system and discuss the importance of stability studies in power system planning and operation.**	**C301.5**	**AZ**
	or		
16	**Write a short note on** **i. Factors influencing transient stability,** **ii. Voltage collapse**	**C301.5**	**U**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff Incharge:
Dr.M.V.Suganyadevi, ASP/EEE and Mr.B.Paranthagan, ASP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/Session	28.09.2018/ AN	Marks	50
Course code	EE6504	Course Title	Electrical Machines - II			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	III	Semester/Section	V / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Why the starter is necessary to start a 3 phase induction motor?	C305.4	R
2	What is the effect of change in input voltage on starting torque of induction motor?	C305.4	U
3	Mention the merits, demerits and applications of star-delta and stator resistance starter.	C305.4	R
4	What is meant by single phasing?	C305.4	U
5	A small three phase induction motor has a short circuit current equal to 4 times of the fill load current. Determine the starting torque as a % of full load torque if full load slip is 2.5%	C305.4	U
6	Why the single phase induction motor is not self starting and Explain how the single phase induction motor is made self starting.	C305.5	U
7	Why centrifugal switches provided on much single phase induction motor?	C305.5	U
8	What is the effect of increasing rotor resistance in a single phase induction motor?	C305.5	U
9	What is a Universal motor? How can the direction of rotation be reversed?	C305.5	U
10	Name the motor being used for ceiling fan.	C305.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	What are the types of starters available for squirrel cage induction motor? Explain with neat sketch the working and relation between starting and full load torque of any two types of starters.	C305.4	U
	or		
12	Describe the starter available only for a three phase slip ring induction motor and derive the resistance steps for 3-pahse Slip Ring Induction Motor.	C305.4	U
	or		
13	Using double field revolving theory, explain why a single phase induction motor is not self starting. Also discuss the equivalent circuit of single phase induction motor with necessary equations.	C305.5	U
	or		
14	Discuss in detail the operation of hysteresis motor and AC series motor.	C305.5	U

PART-C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss the method of speed control of squirrel cage induction motor by (i). slip power recovery scheme (ii).cascade operation. Derive the expression for the speed of the cascaded set.	C305.4	U
	or		
16	Explain in detail with neat sketch the braking mechanism of three phase induction motor.	C305.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Incharge: Mr.P.Ramesh Babu & Mr. P.K.Arun Kumar

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/Session	27-09-18/AN	Marks	50
Course code	EE6503	Course Title	POWER ELECTRONICS			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	III	Semester/Section	V / 'A & B'	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is a step up Chopper?	C304.3	R
2	Define duty cycle.	C304.3	R
3	What is the need for filter at the output of DC-DC converter?	C304.3	U
4	What is Current Limit Control in choppers?	C304.3	U
5	Draw the power circuit of a four quadrant chopper.	C304.3	A
6	What is meant by an inverter? List out its applications.	C304.4	AZ
7	Why thyristors are not preferred for inverters?	C304.4	R
8	Differentiate VSI from CSI.	C304.4	A
9	Define Total Harmonics Distortion (THD)	C304.4	R
10	Why thyristors are not preferred for inverters?	C304.4	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain with waveform the operation of 3 phase inverter for 180 degree mode of conduction.	C304.4	A
	or		
12	Describe in detail, the various types of PWM methods available for voltage control employed in an inverter.	C304.4	R
13	With the neat circuit and output wave forms, explain the operation of three phase bridge inverter in 120 degree mode of operation.	C304.4	A
	or		
14	Demonstrate the working of a single phase full bridge inverter supplying R, RL loads with relevant circuit and waveforms.	C304.4	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss the principle of operation of DC-DC step down chopper with suitable waveform. Derive an expression for its average DC output voltage.	C304.3	R
	or		
16	With neat sketch explain the operation of buck converter with its wave for continuous conduction mode and derive the necessary parameters to design a buck converter.	C304.3	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of Faculty: S.Ramprasath & R.Balasubramanian

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/Session	29-09-18/FN	Marks	50
Course code	PX5005	Course Title	HVDC transmission			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	2018	Semester/Section	II / 'A'	Department	ME - PED	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions
1	Write the fundamental components of harmonics with a order of 'h'?
2	Define Synchronous Condenser
3	How can we avoid the interference occur in communication line?
4	Define single tuned filter?
5	State the basic physical phenomenon arising in DC insulation?
6	What is meant by HVDC system simulation?
7	What are the requirements for good simulation tool?
8	What are the two approaches are available in transient analysis of simulation?
9	Define Telephone influence factor.
10	What will be the current regulation in inverter side?

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions
11	Derive an equation for harmonic voltage and current for single tuned filter and discuss the influence of network admittance.
	Or
12	What are the filter configuration that are employed for HVDC Converter station ? Give design aspect of one such filter.
13	Explain in detail about HVDC system simulation
	Or
14	Describe the philosophy and tools used in HVDC simulation.
	Part - C (10 marks)
15	Explain in detail about the modeling of HVDC system for digital dynamic simulation.

Faculty In charge: S.Ramprasath / AP /EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – III			Date/Session	28/9/2018/AN	Marks	50
Course code	EE8353	Course Title	ELECTRICAL DRIVES AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2018 – 2019	
Year/	II	Semester/Section	III/A&B	Department	MECH	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define Duty cycle of a DC chopper.	205.5	A
2	Mention the speed control types of DC series motor.	205.5	U
3	What do you mean my TRC control in chopper?	205.5	R
4	Write the expression for armature voltage of half and fully controlled rectifiers.	205.5	R
5	What are the applications of Choppers?	205.5	U
6	What is slip power scheme?	205.6	R
7	What are the advantages of V/F control of 3 phase AC motor?	205.6	U
8	List the various methods of speed control of 3 phase induction motor.	205.6	R
9	Mention the advantages of slip power scheme.	205.6	R
10	Draw the block diagram of cascaded speed control method.	205.6	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	A 220V, 24 A 1000 rpm separately excited DC motor has an armature resistance of 2 ohms. Motor is controlled by a chopper operating at 500Hz from a 230V supply. Calculate the duty ratio for 1.2 times rated torque and 500 rpm.	205.5	U
	Or		
12	Explain the operation of Ward Leonard System in detail.	205.5	U
13	Draw and explain the 4-Quadrant operation of DC motor using various choppers	205.5	AZ
	or		
14	What are the methods to control the choppers? Explain in detail.	205.5	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the operation of slip power recovery scheme to control the speed of 3 phase induction motor.	205.6	R
	Or		
16	Draw and Explain the types of stator side speed control methods of an induction motor.	205.6	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty In-charge : *Mr.R.Vijay AP/EEE & Ms.N.Karthika AP/EEE*

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/Session	29-09-18 /AN	Marks	50
Course code	EE6008	Course Title	MICRO CONTROLLER BASED SYSTEM DESIGN			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	IV	Semester/Section	VII /A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	List down the different operating modes of ARM processor	C406.5	R
2	Explain the bit configuration of CPSR register.	C202.5	U
3	Mention some of the ARM development tools.	C406.5	R
4	Define context switching.	C406.5	AZ
5	Draw the structure of multicycle instruction in 3 stage pipeline.	C406.5	U
6	State the function of ARMulator and define its operation at various levels.	C406.5	R
7	What is the role of coprocessor?	C406.6	AZ
8	List out few embedded applications for ARM processor.	C406.6	AZ
9	What is 5 stage pipeline in ARM processor?	C406.6	R
10	State the function of CPSR.	C406.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the ARM programmer's model in detail with supporting diagram.	C406.5	R
	Or		
12	Write short notes on ARM MMU structure.	C406.5	R
13	Using suitable example, explain the various instruction set of ARM processor.	C406.5	E
	Or		
14	Explain how does the coprocessor interface work.	C406.5	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Write short notes on 3-stage and 5-stage pipeline of ARM processor.	C406.6	AZ
	Or		
16	Elaborate the working principle of VLSI ISDN subscriber processor in detail.	C406.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Staff In-Charge : Dr.S. Vijayalakshmi/Asso. Prof/EEE, B. Paranthagan/ Asso. Prof./EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/Session	29.09.18/FN	Marks	50
Course code	EE6701	Course Title	HIGH VOLTAGE ENGINEERING			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	IV	Semester/Section	VII / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is stressed oil volume?	C401.2	U
2	Define burst corona and Trischel pulses.	C401.2	R
3	What is the usual range of vacuum used in high voltage apparatus?	C401.2	R
4	Define intrinsic strength of solid dielectric.	C401.2	U
5	What is meant by Penning effect?	C401.2	U
6	Enumerate the difference between type and routine tests?	C401.5	U
7	Define impulse voltage and withstand voltage	C401.5	R
8	Define 50% and 100% flashover voltage?	C401.5	AZ
9	Define creepage distance?	C401.5	R
10	What is meant by Insulation Coordination	C401.6	R

Part – B

(Answer all the questions2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	How bubbles/cavities and stressed oil volume lead to breakdown in commercial liquid dielectrics?	C401.2	R
	or		
12	Derive the condition for breakdown in gaseous dielectric and hence obtain Paschen's law. Show the variations of sparking potential with (pd) values and explain such variations.	C401.2	AZ
13	Discuss the different high voltage tests conducted on insulators.	C401.5	U
	or		
14	List the different power frequency tests done on bushing?	C401.5	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

15	Briefly explain short circuit plant pertaining to testing of CB	C401.5	A
	Or		
16	Elaborately discuss about various types of standards for HV power apparatus testing of electrical power apparatus	C401.5	C

Bloom's skills: Remember (R), Understand (U), Apply (A), Analyze(AZ), Evaluate (E), and Create (C)

Faculty : R.SATHEESH-EEE & S.SIVAKUMAR

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test - III			Date/ Session	28/09/2018 (FN)	Marks	50
Course code	EE6703	Course Title	SPECIAL ELECTRICAL MACHINES			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/ Section	VII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Why is the PMBLDC motor called electronically commutated motor?	C403.5	AZ
2	What are the classification of BLPM dc motor?	C403.5	U
3	Draw the magnetic equivalent circuit of BLPM DC Motor.	C403.5	R
4	Define Coercive force.	C403.5	R
5	What are the applications of BLPM DC Motor?	C403.5	U
6	A PM DC Commutator Motor has a stalling torque of 1 N-m, with the starting current of 5A. Estimate its No-Load speed when a motor is fed from a 28 v DC supply.	C403.5	AZ
7	What are the two types of rotor position sensors?	C403.6	U
8	What are the features of Sine wave Motor?	C403.6	U
9	List the types of PMSM based on Rotor construction.	C403.6	R
10	Draw the Block diagram of PMSM.	C403.6	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the construction and working principle of BLPM DC Motor with a neat diagram with their merits and demerits.	C403.5	U
	or		
12 a)	Derive the expression for the Torque of a PMBLDC motor. (6)	C403.5	AZ
12 b)	Sketch the torque-speed characteristics of a PMBLDC motor. (4)	C403.5	R
13	Explain the construction and working principle of PMSM with a neat diagram with their merits and demerits.	C403.6	U
	or		
14	Derive the EMF Equation of PMSM.	C403.6	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	With the neat diagram, Compare the operation of Electronic and Mechanical Commutator.	C403.5	AZ
	or		
16	Explain the closed loop control scheme of a permanent magnet brushless dc motor drive with a suitable schematic diagram.	C403.5	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE & Ms.K.Gaayathry AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	27.09.2018/AN	Marks	50
Course code	EE6005	Course Title	POWER QUALITY			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	IV	Semester/ Section	VII / B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define point of common coupling.	C405E4.4	A
2.	What is the difference between harmonics and Transients?	C405E4.4	R
3.	Define inter harmonics	C405E4.4	R
4.	State the objectives of power quality monitoring?	C405E4.5	R
5.	What are the functions of static electricity meter?	C405E4.5	E
6.	Write the merits of Digital Power quality analyzer.	C405E4.5	R
7.	List some of the power quality monitoring equipment.	C405E4.5	AZ
8.	What is harmonic analyzer?	C405E4.6	R
9.	Define power quality monitoring.	C405E4.6	U
10.	What is flicker meter?	C405E4.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	i) Explain the process of locating harmonic sources. ii) Explain the harmonic sources from commercial and industrial loads.	C405E4.4	AZ
	OR		
12.	What are the devices used for controlling harmonic distortion and explain their functions?	C405E4.4	A
13.	Discuss the power quality monitoring considerations in detail.	C405E4.5	A
	OR		
14.	Explain briefly the application of expert system for power quality monitoring.	C405E4.5	R,E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Give a brief account on disturbance analyzer for power quality monitoring.	C405E4.6	E
16.	Explain in detail about the flicker meter.	C405E4.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff Incharge:
Dr.M.V.Suganyadevi, ASP/EEE
Mr.T.Tamilarasan, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/Session	28.09.18/FN	Marks	50
Course code	MG6851	Course Title	PRINCIPLES OF MANAGEMENT			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/Section	VII/ A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is Recruitment?	C309.4	U&C
2	What is Selection?	C309.4	U&C
3	Define Motivation?	C309.4	U&C
4	What is HR planning?	C309.4	U&C
5	Explain 360 degree appraisal?	C309.4	U&C
6	State the importance of Orientation in HR process.	C309.4	U&C
7	What is Career planning?	C309.4	U&C
8	Explain BARS in performance appraisal.	C309.4	U&C
9	What is 'Hygiene factors' in Two factor theory	C309.5	U&C
10	What is Extrinsic motivation?	C309.5	U&C

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the various sources of Recruitment? Give examples	C309.4	U&C
12	What are the various steps involved in the Selection process?	C309.4	U&C
13	Explain the various methods of Performance Appraisal available to the HR manager.	C309.4	U&C
14	Short notes on (a) Maslow's Theory of Needs (b) Two Factor theory	C309.5	U&C

Part – C

(Answer all the questions 1 x 10 = 10marks)

15		CO	Skills
	Ice Cool Private Limited was an Ice cream manufacturing company employing about 100 persons including persons at various levels of management. Because of increasing business, the company needed to strengthen its accounting procedure particularly through computerization. For this purpose, the company decided to hire a new manager designated as assistant manager. The company invited applications through press advertisement. After receiving the applications, it appointed a selection committee consisting of members of top management including business manager Rakesh Mohan. The Committee interviewed several candidates and finally selected Bishwash as new Assistant Business manager. Biswash was neat, well dressed and quite articulate. Biswash joined the company immediately and started working very hard. He used to put extra efforts and even worked during holidays as he did not have any family responsibility. He gained the reputation of being dedicated and competent employee, his strong point being his knowledge of accounting and computer system. He was reporting to Rakesh Mohan, the business manager who was quite impressed with his working. At that time, the company had no computer system, and their accounting procedures were in need of considerable improvement. Anil kumar, the managing director of the company, directed Rakesh Mohan to get the needful done. Since most of the accounting work related to sales, no separate accounting department existed and the work was performed under the	C309.6	A

direction of business manager.

Biswash was mainly appointed to strengthen the accounting aspects of the business. He was asked to prepare a project report so that necessary changes could be made. In order to get the first hand information about the problem, Biswash began meeting regularly with Anil kumar without the knowledge of Rakesh Mohan.

There was no attempt to have secret meeting. Anil kumar would just call Biswash in for a report without bothering to tell Rakesh Mohan. The management team, whose members were with the company for a quite long period had formed a tight-knit group and appeared satisfied with the company. They all worked together and the company prospered in spite of fierce competition.

The meetings between Anil kumar and Biswash continued and Rakesh Mohan was gradually losing contact with the Project and its Progress. In fact, Biswash was almost reporting directly to the managing director though he was placed under the Business manager and retained his title of assistant business manager. Rakesh Mohan was visibly upset over the development and was also concerned about Biswash's spreading share of influence. He started feeling let down in the company.

QUESTIONS:-

- What is the nature of problem in this case?
- Could Rakesh Mohan have prevented Biswash's assumption of power? If so, how specifically could it have been done?
- Suggest the course of action now available to Anil Kumar, Rakesh Mohan and Biswash?

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/ Session	27.09.18/ FN	Marks	50
Course code	PX5072	Course Title	Power Electronics for Renewable Energy Systems			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/ Section	III	Department	M.E.-PED	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is mean by pitch control?	C201.4	R
2	Define solar insolation	C201.4	R
3	Write about opti slip concept used in wind energy conversion system	C201.4	AZ
4	Differentiate between fixed and variable speed wind energy conversion system	C201.4	AZ
5	Mention some of the standards used for grid integration	C201.4	AZ
6	List different types of hybrid system.	C201.5	U
7	How is electrical maximum power tracking different from a mechanical sun tracking of a PV module?	C201.5	AZ
8	What is the necessity of maximum power point tracking in PV system?	C201.5	A
9	What are the advantages of PV – diesel hybrid system	C201.5	AZ
10	Define charge controllers used in wind energy conversion system	C201.5	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Derive an expression for power extracted from wind	C201.4	E
11 b	Explain fixed-speed grid connected wind energy conversion system with a squirrel cage induction generator	C201.4	AZ
	or		
12	Explain the grid related problems in wind farms and refer the performance improvements of generator controls	C201.4	E
13	What are the commonly used algorithms for MPPT? Explain P&O MPPT algorithm with a neat flow chart	C201.5	AZ
	or		
14	Enlighten the need and advantage of hybrid renewable energy systems. Also explain the operation of wind-PV hybrid system with neat diagrams	C201.5	E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Design a hybrid PV system which should be able to supply the power to the load of your college for 24 hours. It should be using solar, diesel and wind as the source of energy. Explain with neat block diagram.	C201.5	AZ
	or		
16	Explain with an example how to control the harmonics and improve the power quality when solar PV is connected to the grid	C201.5	AZ

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/Session	27.09.2018/ FN	Marks	50
Course code	EE6702	Course Title	Protection and Switchgear			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/Section	VII / A & B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define RRRV.	C407.5	R
2	Define breaking capacity and making capacity of a circuit breaker.	C407.5	R
3	What are the difference between isolator and circuit breaker?	C407.5	U
4	Give the advantage of SF6 circuit breaker over Air blast circuit breaker.	C407.5	R
5	Name the materials used for constructing vacuum circuit breakers.	C407.5	R
6	Why current chopping is not common in oil circuit breaker?	C407.6	U
7	What is meant by auto-reclosing?	C407.6	U
8	Differentiate AC and DC circuit breaking.	C407.6	U
9	Define the importance of arc resistance?	C407.6	R
10	State the significance of synthetic testing methods.	C407.6	R

Part – B
(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Explain the construction details, operating principle and applications of MOCB.	C407.5	U
	Or		
12	Describe the construction details, operating principle and applications of SF6 circuit breaker.	C407.5	U
13	Explain the following terms in detail: a) Resistance switching. b) Current chopping. c) Interruption of capacitive current.	C407.5	U
	Or		
14	a) Derive the expression for restriking voltage and RRRV. b) Explain about current zero interruption theories.	C407.5	U
15	Describe the construction details, operating principle and applications of air break and air blast circuit breaker.	C407.6	U
	Or		
16	What are the different methods of testing of circuit breakers? Discuss their merits and demerits.	C407.6	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/ Session	28.09.2018 /FN	Marks	50
Course code	PS5072	Course Title	Solar and Energy Storage Systems			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/ Section	III	Department	PED	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	List the important factors of effective vehicle design.	C202.5	R
2	Mention the applications of secondary or rechargeable batteries.	C202.5	R
3	How is PV system used for telecommunication?	C202.5	R
4	Draw the block diagram of solar based water pumping system.	C202.5	E
5	Why there is a delay in practical use of solar car?	C202.5	E
6	Define radiation hardness?	C202.5	E
7	What is meant by direct driven PV cell?	C202.5	R
8	What are the advantages and disadvantages of solar water pumping?	C202.5	A,R
9	What is a transportable PV power supply.	C202.5	A,R
10	Mention the application of direct driven PV cell.	C202.5	A,R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Describe the potential of solar cars in becoming a common vehicle considering the following: 1.Cost 2.Safety 3. Current status 4. Potential problems and obstacles 5. Controller	C202.5	E
	Or		
12	Explain any three telecommunication applications powered by solar cell.	C202.5	E
13	Explain in detail the usage of PV systems in direct drive applications	C202.5	E
	Or		
14	Describe a solar water pump with the following consideration. 1. Calculate the water pumping load and pumping rate 2. Calculate current & system array size 3. Design the controller 4. Select switching and protecting components 5. Design DC wire size.	C202.5	E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	With a neat diagram explain battery charger circuit.	C202.5	A
	Or		
16	Explain the solar based street lightning system with its subcomponents.	C202.5	A

Staff Incharge: V.Ajitha /AP/EEE

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

2018-2019 - EVEN SEMESTER

INTERNAL ASSESSMENT QUESTION

PAPERS

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/Session	14/02/19/FN	Marks	50
Course code	PX5251	Course Title	Special Electrical Machines			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	I	Semester/Section	II	Department	ME(PED)	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions
1	Draw the speed torque characteristics of Hysteresis motor.
2	Mention the applications of hysteresis motor.
3	List the merits and demerits of hysteresis motor.
4	What is the reason behind the name Hysteresis motor?
5	What are the two types of AC series motor?
6	List the applications of Ac series motor.
7	Why should a series motor never be operated on no load?
8	Compare linear electric motor with rotary motor
9	List the applications of Linear induction motor.
10	Draw the equivalent circuit of linear induction motor.

Part – B

(Answer all the questions 2 x 10 = 20marks)

11	With neat diagram explain the construction and working principle of Hysteresis Motor (10)
(OR)	
12	Explain the mathematical analysis of hysteresis motor pertaining to power and torques.
13	Explain the construction details of Various types of LIM.
(OR)	
14	Explain in detail the characteristics of single phase series motor.

Part – C

(Answer all the questions 1 x 10 = 10marks)

15	Describe in detail the fundamental characteristics of permanent magnets.
(OR)	
16	Explain the construction and working principle of PMBLDC motor.

Faculty In Charge : Mr. P. Ramesh Babu / Dept. of EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	15-01-2019/ FN	Marks	50
Course code	PX5004	**Course Title**	Modern rectifiers and Resonant converters			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	I	**Semester/ Section**	II	**Department**	ME(PED)	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question
1	Give an expression for average voltage of single phase full wave uncontrolled rectifier.
2	It is required to implement a chopper fed control of a 12 V DC motor. Which power electronic switch (IGBT or MOSFET) is preferred? Why?
3	Define Distortion factor and give its expression
4	Write down the expression for THD interms of Distortion factor
5	List out the different standards for Voltage and current harmonics in the power system
6	Calculate the average power from $v(t) = 1.2\cos(\omega t) + 0.33\cos(3\omega t) + 0.2\cos(5\omega t)$ $i(t) = 0.6\cos(\omega t + 30°) + 0.1\cos(5\omega t + 45°) + 0.1\cos(7\omega t + 60°)$
7	What the effect of product of two different frequency components. Justify the answer.
8	What is the effect of source impedance
9	Define Form Factor
10	Define THD

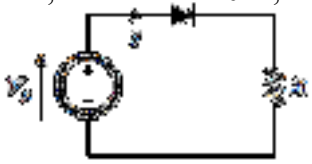
Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions
11	Explain in detail about the operation of single phase full wave rectifier in CCM and DCM operations
	or
12	Briefly explain the standards IEC1000 and IEEE519
13	Explain in detail about the operation of three phase full wave rectifier in CCM and DCM operations
	or
14	Discuss the effect of small and large values of C in the behavior of full wave rectifier

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions
15	Discuss Harmonic Trap filters
	or
16	The current in the circuit is , when Vs = 10V , Diode drop is 0.7V and R=1 k ohm 

Faculty In charge:S.Sivakumar /AP/EEE/SCE

Saranathan College of Engineering, Tiruchirapalli - 12

Internal Assessment Test - I			Date/ Session	13/02/19 FN	Marks	50
Course code	PX 5201	**Course Title**	Analysis and Design of Inverter			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	I	**Semester/ Section**	II/A	**Department**	MEPED	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions
1	What is Inverter? Explain its types.
2	What are the applications of Inverter?
3	Define shoot through fault.
4	Define THD
5	State LOH
6	What are the voltage controls of single phase Inverter?
7	What are the needs of the diodes in the Inverter?
8	Define Distortion factor.
9	What are the drawbacks in the Inverter?
10	What are the techniques in PWM?

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions
11 a	Define single phase HBI?
11 b	Explain the circuit operation through waveform and derive the necessary parameters in the Half Bridge Inverter using R load.
	or
12	A single phase Full Bridge Inverter has a resistive load of R = 3 Ω and the DC input voltage Edc = 48 V. Determine i. IGBT ratings ii. THD iii. DF iv. HF & DF of LOH
13 a	What are the advantages of FBI over HBI?
13 b	Explain the circuit operation through waveform and derive the necessary parameters in the Full Bridge Inverter using RL load.
	or
14 a	What are the needs of voltage control in Inverter?
14 b	What are the methods of voltage control in Inverter? Explain any three methods
15	A single phase Half Bridge Inverter has a resistive load of R = 3 Ω and the DC input voltage Edc = 24 V. Determine IGBT ratings ii. THD iii. DF iv. HF & DF of LOH
	or
16	What are the various methods of PWM control? Explain any two methods of it.

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirappalli

Internal Assessment Test - I			Date/Session	15/02/2019 (AN)	Marks	50
Course code	PS5071	**Course Title**	Distributed Generation and Microgrid			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year	I	**Semester/Section**	II / A	**Department**	ME-PE&D	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the primary and secondary energy sources?	C113.1	U
2	What is OTEC and what are the types of OTEC?	C113.1	R
3	Draw the block diagram recuperated microturine.	C113.1	R
4	List the advantages of Hydro power station.	C113.1	R
5	Mention the fuels used in Nuclear power generation.	C113.1	U
6	Distinguish Yaw control and Pitch control.	C113.1	U
7	Mention the applications of Microturbine.	C113.1	U
8	Define Distributed energy resources.	C113.2	U
9	What is the topologies of Distributed system?	C113.2	R
10	What are the factors to be considered in selection of sources of DG?	C113.2	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a)	Explain the Solar Power Generation System with a neat diagram.	C113.1	U
	or		
12	Explain the structure, types of Wind Energy power generation.	C113.1	U
13 a)	Explain the principle of Microturbine energy generation with their advantages and disadvantages.	C113.1	U
	or		
14 a)	Discuss in detail the fuel cell characteristics and explain the construction and working of PEMFC and SOFC.	C113.1	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the IEEE 1547-standards for interconnection of distributed resources to the electric power system.	C113.2	R
	or		
16 a)	Discuss the Energy crises in India.	C113.2	C
16 b)	Discuss the security issues of DG implementations	C113.2	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name:Ms.C.PearlineKamalini AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/ Session	14.02.19/ AN	Marks	50
Course code	PX5252	**Course Title**	Power Quality			
Batch No.		**Duration**	90 mins	**Academic Year**	2018-2019	
Year	I	**Semester/ Section**	II	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is power quality?	C111.1	U
2	Distuinguish between Nonlinear and Unbalanced loads.	C111.1	AZ
3	What is the need for Power quality standards?	C111.1	AZ
4	Define Voltage Sag and Swell.	C111.1	R
5	List the types of waveform distortion.	C111.1	R
6	Find the total harmonic distortion of a voltage waveform with the following harmonic frequency make up: fundamental=114v, 3^{rd} harmonic=4v, 5^{th} harmonic=2v, 7^{th} harmonics=1.5v and 9^{th} harmonic=1v.	C111.1	E
7	What is DC offset in loads?	C111.1	U
8	Define the term Voltage Regulation.	C111.2	R
9	How to neutralize the harmonics in non-linear loads?	C111.2	AZ
10	Mention the harmonic sources from industrial loads.	C111.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain about CBEMA and ITC curve , also state its significance in power quality	C111.1	U
	OR		
12	Explain about long duration voltage variations and short duration voltage variations	C111.1	U
13	What is the importance of power quality standards, explain any four IEEE power quality standards.	C111.1	AZ
	OR		
14	Name and explain the characterization of electric power quality and explain any four power quality problems with an example	C111.1	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss the three phase , three wire and three phase four wire system and their role power quality with suitable illustrations	C111.2	A
	OR		
16	Describe in detail about non sinusoidal voltage source supplying non linear load current with a suitable example	C111.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/ Session	13.02.2019 / AN	Marks	50
Course code	PX5202	Course Title	SOLID STATE DRIVES			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	I- M.E (PED)	Semester/ Section	II	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions
1	What is phase control?
2	What is the effect of current ripple in continuous current operation?
3	Mention the performance parameters of single phase converters.
4	Write the importance of freewheeling diode in the converter circuits.
5	What basic current ripple affects the performance of converter?
6	Draw the circuit diagram for three phase dual converter drive for dc separately excited motor.
7	What are the effects of source inductance on converters?
8	What is meant by regenerative braking
9	Mention the performance parameters of 3-phase converter control of separately excited DC motor.
10	What are the advantages of three phase drives over single phase drives?

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q.No.	Questions
11	Explain with relevant diagrams the single phase methods of phase control operation of a dc separately excited motor.
	or
12	Explain with relevant diagrams the single phase methods of phase control operation of a dc series motor.
13	Explain the three phase full converter fed separately excited dc motor for continuous armature current operation with circuit and waveforms and obtain expression for performance parameter.
	or
14	Discuss the various modes of operation of three phase dual converter

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions
15	A200V, 875 rpm, 150A separately excited dc motor has an armature resistance of 0.06 ohm. It is fed from a single phase fully controlled rectifier with an ac source voltage of 220 V, 50Hz. Assuming continuous conduction, calculate (i) firing angle for rated motor torque and 750 rpm. (ii) firing angle for rated motor torque and (-500) rpm. (iii) motor speed for $\alpha = 160^0$ and rated torque
	or
16	A 220V, 1500 rpm, 50 A separately excited dc motor has an armature resistance of 0.5ohm is fed from a 3- phase fully controlled rectifier with an ac source voltage of 240 V, 50Hz. A star- delta connected transformer is used to feed the armature so that motor terminal voltage equals rated voltage when converter firing angle is zero. (i) Calculate transformer turns ratio. (ii) determine the value of firing angle when: (a) motor is running at 1200 rpm and rated torque; (b) motor is running at -800 rpm and twice the rated torque

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – I			Date/Session	14.02.19/AN	Marks	50
Course code	BE8251	Course Title	BASIC ELECTRICAL AND ELECTRONICS ENG.			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	I	Semester	II/	Department	CIVIL	

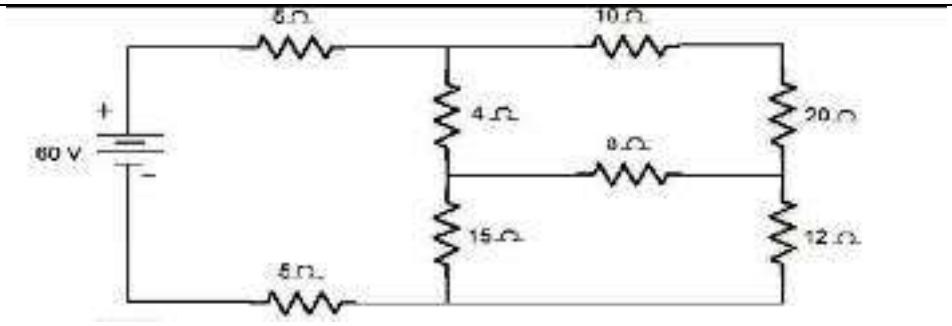
Part – A

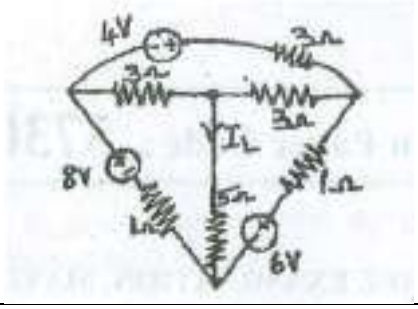
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define ohmslaw?	112.2	R
2	Define the principle of DC generators?	112.2	R
3	Mention the different parts in a DC MACHINE?	112.2	U
4	What is the purpose of commutator?	112.2	U
5	Mention the different types of D.C generator.	112.2	U
6	What are active and passive elements? Give an example.	112.2	U
7	Two resistors 5ohm and 10 ohm are connected in parallel calculate the equivalent resistance?	112.1	AZ
8	A 100 ohm resistor is connected to a10v dc source calculate current through 10 ohm resistor and power?	112.1	U
9	What is meant by balanced load?	112.1	E
10	Relation between line voltage and phase voltage in star and delta connection	112.1	AZ

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Explain the construction and operational principle of D.C generator with all its basic equations. .(Including diagram)	112.2	A
	Or		
12	 **Determine the power in 8 ohm resistor using mesh analysis.**	112.2	U

13	**Determine the power in 2 ohm resistor using nodal analysis.** 	112.3	A
	Or		
14	Derive the expression for EMF equation of dc generator &Types of Dc generator	112.3	A
15	Explain the operational principle of PMMC instruments with torque equation and diagram.	112.1	U
	Or		
16.	Explain the working principle of MI instruments with torque equation diagram.	112.1	U

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Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

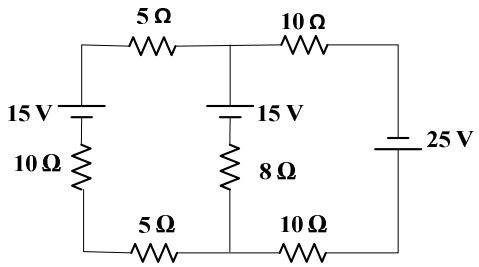
Saranathan College of Engineering
Tiruchirapalli

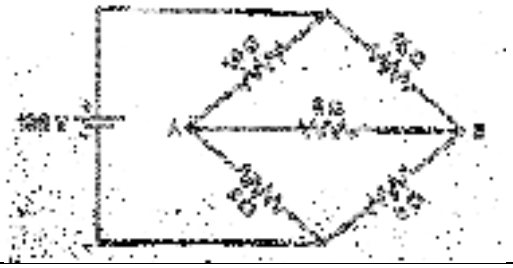
Internal Assessment Test - I			Date/ Session	14.02.19 / AN	Marks	50
Course code	BE8253	**Course Title**	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING			
Batch No.		**Duration**	90 mins	**Academic Year**	2018-2019	
Year/	I	**Semester/ Section**	II / A&B	**Department**	Mechanical Engineering	

Part – A
(Answer all the questions 10 x 2 = 20marks)

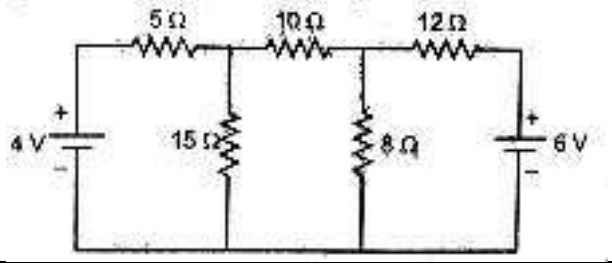
Q. No.	Questions	CO	Skills
1	Define Electrical potential.	C112.1	R
2	Write the VI relationship for an capacitor.	C112.1	U
3	What is bilateral network?	C112.1	R
4	A electric heater draws 8A from 220V DC supply. What is its power rating? Also calculate its resistance.	C112.1	A
5	Mention the limitations of Ohm's law.	C112.1	U
6	State Kirchoff's laws.	C112.1	R
7	What is the total capacitance when capacitors having capacitances 1μF, 2 μF, 3 μF are connected in series?	C112.1	A
8	State Norton's Theorem.	C112.1	R
9	Write the condition for the maximum power transfer from source to load.	C112.1	U
10	Mention the various types of wiring.	C112.2	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11a	Find the current in the 8 Ω resistor in the following circuit using Kirchoff's laws. 	C112.1	AZ
	OR		
11b	Explain about the fluorescent lamp wiring with neat circuit diagram.	C112.2	U

12 a	Using Mesh analysis, find the current through various branches in the circuit below.	C112.1	AZ
	OR		
12b	Use Thevenin's theorem find the load current in 5Ω resistor in the given circuit. 	C112.1	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
13 a	Using nodal analysis find the current through 8Ω resistor in the given circuit. 	C112.1	AZ
	OR		
13b	Find the current in all branches in the given circuit using superposition theorem. Given V_1 = 10V; V_2 = 10V; R_1= 220Ω; R_2=330 Ω; R_3=150 Ω. 	C112.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Members:

Mr.R.Sridhar, AP/EEE, I-Mech-A
Mr.P.Ram Prakash, AP/EEE, I-Mech-B

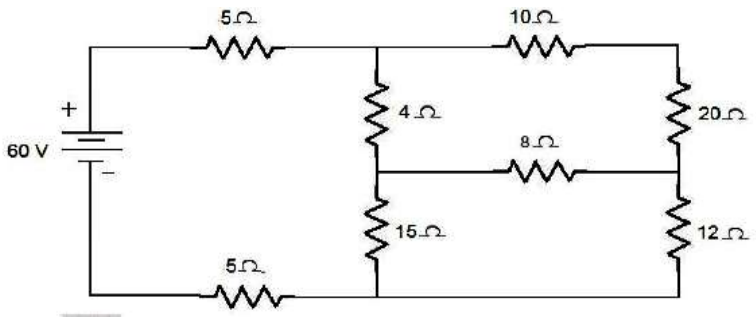
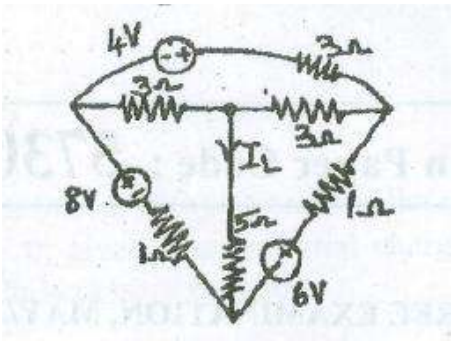
Saranathan College of Engineering
Tiruchirapalli

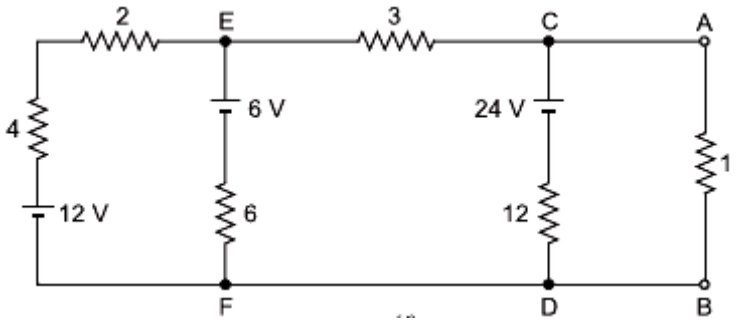
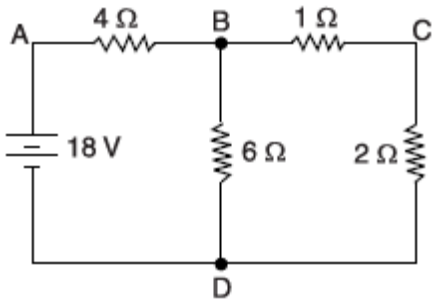
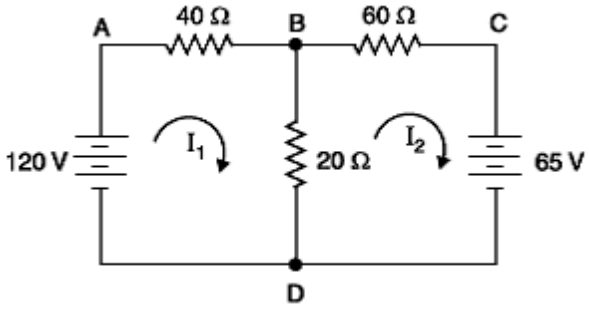
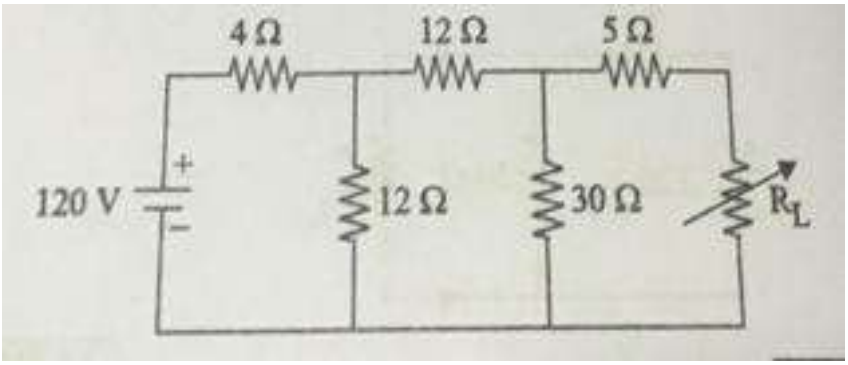
Internal Assessment Test - 1			Date/ Session	14.02.2019/ AN	Marks	50
Course code	BE8255	Course Title	Basic Electrical Electronics & Measurement Engineering			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	I	Semester/ Section	II	Department	CSE(A&B)/IT	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define ohms law and write its Limitation?	C112.1	R
2	Define kirchoff's voltage and current law.	C112.1	AZ
3	Two inductances L_1=3mH and L_2=6mH are connected in parallel. Determine Leq.	C112.1	AZ
4	Find the equivalent capacitance when two capacitors are connected in series.	C112.1	AZ
5	Distinguish between mesh and loop of a circuit.	C112.1	A
6	State thevenins theorem.	C112.2	R
7	Define Norton theorem.	C112.2	A
8	What is the condition for maximum power transfer in DC circuits?	C112.2	R
9	Define superposition theorem.	C112.2	R
10	Differentiate active and reactive power in electrical circuits.	C112.2	R

Part – B
(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	 Determine the power in 8 ohm resistor using mesh analysis.	C112.1	AZ
	or		
12	 Determine the power in 2 ohm resistor using nodal analysis.	C112.1	AZ

13	**Using Thevinin's theorem, find current through 1Ω resistor. All resistances are in ohms.** 	**C112.2**	**AZ**
	or		
14	**Using Norton's theorem, find current through 2Ω resistor.** 	**C112.2**	**AZ**
15	 **Compute the current in 20 ohm resistor using superposition theorem.**	**C112.2**	**AZ**
	Or		
16	 **Find the value of R using maximum power transfer theorem.**	**C112.2**	**AZ**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff name: M.Marimithu(I-CSE"A") , N.Karthika (I-CSE"B"), N.Vijayasarathi (I-IT)

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/ Session		Marks	50
Course code	BE8254	Course Title	Basic Electrical & Instrumentation Engineering			
Batch No.		Duration	90 mins	Academic Year	2018-2019	
Year/	I	Semester/ Section	II/A&B	Department	ECE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Draw the circuit diagram for measuring three phase reactive power using one wattmeter	C112.1	E
2	What is meant by tariff and state its objective.	C112.1	R
3	Write the expressions for determining real, reactive and apparent power	C112.1	R
4	Define balanced and unbalanced load	C112.1	R
5	Define phase and negative phase sequence	C112.1	R
6	State the advantages of three phase system	C112.1	U
7	What is the sub transmission system?	C112.1	AZ
8	What is meant by protective relays?	C112.1	U
9	Define transformer and draw its equivalent circuit	C112.2	R
10	What is staggering in the construction of transformer?	C112.2	AZ

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.		Questions	CO	Skills
11a	(i)	A 415V, 3 phase voltage is applied to a balanced delta connected load of phase impedances each equal to 15+j20Ω. Find the (i) phase and line values of ciurrent, (ii) power consumed per phase (6)	C112.1	E
	(ii)	Write a short notes on zones of protection (4)	C112.1	AZ
OR				
11b	(i)	Explain in detail about the types of three power measurement (6)	C112.1	AZ
	(ii)	Write a short note on types of tariff (4)	C112.1	AZ
12a	(i)	Deduce the equivalent circuit of transformer (6)	C112.2	E
	(ii)	A sinusoidal flux 0.02 wb links with 55 turns of a transformer secondary coil. Calculate the rms value of the induced emf in the secondary. The supply frequency is 50Hz.	C112.2	E
OR				
12b	(i)	A 1100/110V, 22 kVA single phase transformer has primary resistance and reactance 2Ω and 5Ω respectively. The secondary resistance and reactance 0.02Ω and 0.045 Ω respectively. Calculate : (1) Equivalent resistance and reactance of secondary referred to primary. (2) Total resistance and reactance referred to primary. (3) Equivalent resistance and reactance of primary referred to secondary. (4) Total resistance and reactance referred to secondary. (5) Total copper loss. (10)	C112.2	E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
13 a	The power input to a load was measured by two wattmeter method. The readings were 600W and 400W, the latter readings having been obtained by reversing the potential coil connections. Find active and reactive power and power factor of load	C112.1	**E**
	OR		
13b	Three line voltage of a three phase unbalanced source are V_{ab} = 40V, V_{bc} = -j40V and V_{ca} = -40+j40V. The source is connected to star connected impedance. Z_a = (3+j4)Ω , Z_b = (8+j6)Ω , Z_c = (5+j0)Ω. Determine the currents I_a ,I_b and I_c.	C112.1	**E**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

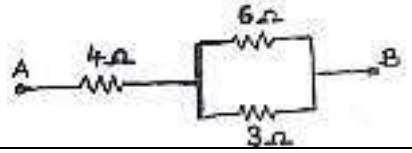
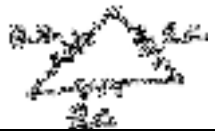
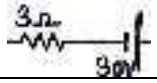
Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	15-02-18 AN	Marks	50
Course code	EE 8251	**Course Title**	CIRCUIT THEORY			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	I	**Semester/Section**	II / A&B	**Department**	EEE	

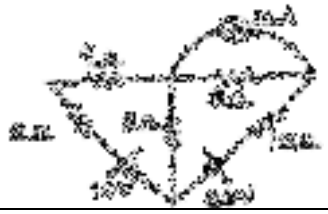
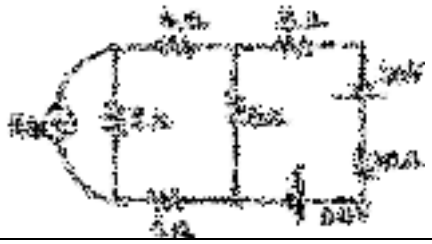
Part – A

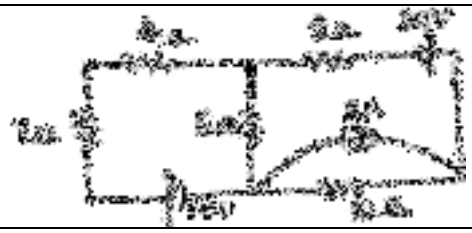
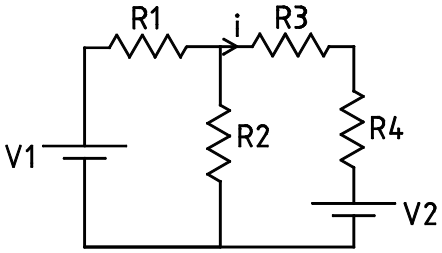
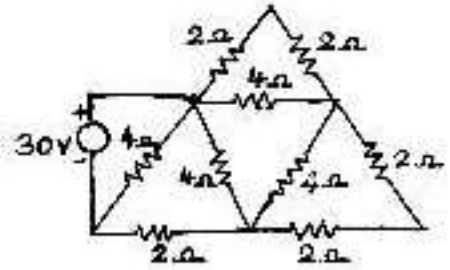
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Kirchoff's current Law.	C113.1	R
2	State Kirchoff's voltage Law.	C113.1	R
3	Two resistors of 5 ohms & 10 ohms are connected in series. If the total voltage drop across two resistors is 12 V, find the voltage drop across 5 ohms resistor	C113.1	E
4	State Ohm's Law.	C113.1	R
5	Distinguish between mesh and loop of a circuit.	C113.1	U
6	Find the equivalent resistance of the circuit shown in fig. 	C113.1	E
7	Convert the given Delta Network into its equivalent star network. 	C113.2	E
8	Convert the voltage source shown in Fig. into its equivalent current source. 	C113.2	E
9	Define Ideal Voltage source	C113.2	R
10	State Current Division Principle	C113.2	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Find the current supplied by each battery in the circuit shown below using Mesh Analysis. 	C113.1	E
	or		
12	Find the loop currents and hence find the power absorbed by 6 ohms resistor. 	C113.1	E
13	Find the node voltages and hence find the voltage across 6 ohms resistor.	C113.1	E

			
or			
14	Find the power dissipated in 10 ohm resistor by nodal analysis method. 	C113.2	E
15	Using superposition theorem find the current through R2. V1=10V, V2=15V, R1 = 2 ohms, R2 = 3 ohms, R3 = 4 ohms, R4 = 5 ohms 	C113.2	E
or			
16	Determine the total current taken from the source using network reduction 	C113.2	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of Faculty : R.Balasubramanian and N.Gayathri

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/ Session	22.01.19/ FN	Marks	50
Course code	EE8403	Course Title	Measurements and Instrumentation			
Batch No.		Duration	90 mins	Academic Year	2018-2019	
Year	II	Semester/ Section	IV / A & B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is meant by measurement? What are the methods of measurements?	C212.1	U
2	What is calibration? Why must instruments be calibrated?	C212.1	U
3	Define average deviation.	C212.1	R
4	Define instrumental errors.	C212.1	R
5	Distinguish between the direct and indirect methods of measurements	C212.1	AZ
6	What is volt ampere hour and watt-hour?	C212.1	U
7	How are the analog instruments classified on the basis of method used for comparing the unknown quantity?	C212.1	AZ
8	How a PMMC meter can be used as Voltmeter and Ammeter?	C212.1	AZ
9	What is creeping in energy meters?	C212.2	U
10	What is the working principle of wattmeter employed in measuring equipment?	C212.2	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	a. Design a multirange ammeter with the ranges of 1A, 10A, 50A and 100A employing individual shunts in each case & D' Arsonval movement with an internal resistance of 750 Ω and full scale current of 5 mA is available. b. Design an Ayrton shunt to provide an ammeter with current ratings of 1A, 10A, 100 A. A basic meter with an internal resistance of 100 Ω and a full scale deflection current of 10 mA is to be used. Explain the working of working PMMC. With neat figure explain the construction, working principle of a Moving coil instrument.	C212.1	AZ
	OR		
12	Describe the construction and working of PMMC instrument.	C212.1	U
13	a. Draw the Block diagram showing the basic functional elements of an instrument and explain the functions of each. (6) b. The expected value of voltage across a resistor is 100 v. However, the measurement gives a value of 98v. Calculate i) Absolute Error ii) Percentage Error (4)	C212.1	U&E
	OR		
14	Explain in detail about the static and dynamic characteristics of a measurement system.	C212.1	U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the construction, working principle of a single phase wattmeter, with neat figures.	C212.2	U
	OR		
16	Give the construction and working principle of a single phase induction type energy meter with Neat diagram and explain in detail.	C212.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

SARANATHAN COLLEGE OF ENGINEERING
Tiruchirappalli

Internal Assessment Test - I			Date/ Session	23.01.2019/FN	Marks	50
Course code	IC8451	Course Title	Control Systems			
Batch No.		Duration	90 mins	Academic Year	2018-2019	
Year	II	Semester/ Section	IV / A & B	Department	EEE	

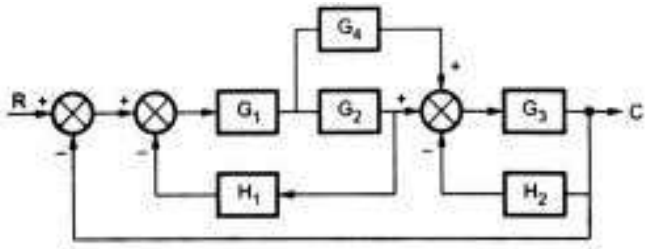
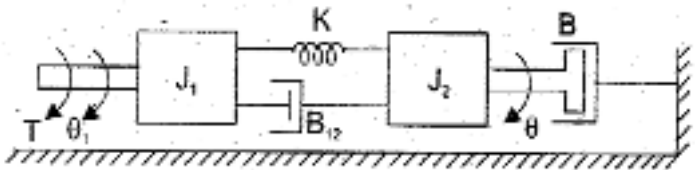
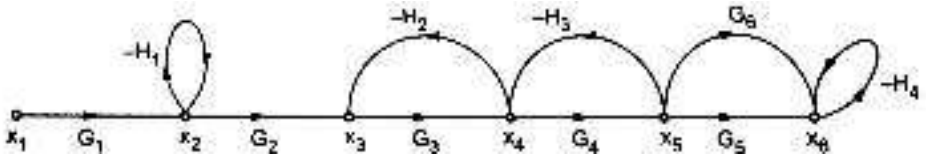
Part – A

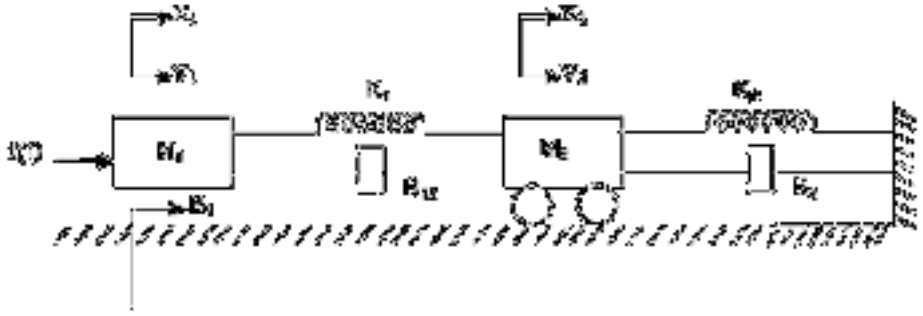
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is control system?	C214.1	R
2	What is transfer function?	C214.1	R
3	What is meant by open loop control system?	C214.1	R
4	List out the advantages and disadvantages of closed loop control system.	C214.1	R
5	What are the basic elements used for modeling Mechanical-Translational system?	C214.1	R
6	What is block diagram?	C214.1	R
7	List out the test signals used in control system	C214.2	R
8	What is a ramp signal?	C214.2	R
9	Define pole.	C214.2	R
10	Define steady state response.	C214.2	R

Part – B

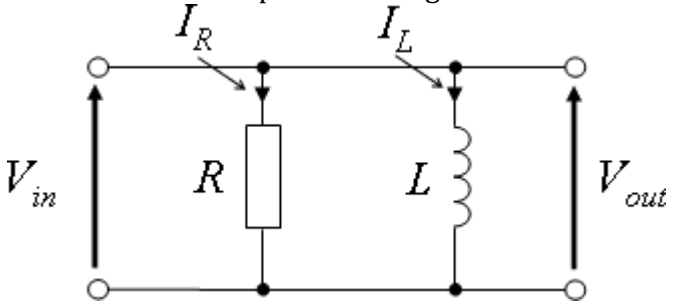
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Obtain the transfer function of C/R of the system using block diagram reduction method. 	C214.1	A, AZ
	OR		
12	Write down the differential equations governing the system shown and obtain the transfer function 	C214.1	A, AZ
13	Obtain the transfer function of the system using Mason's gain formula. 	C214.1	A, AZ
	OR		

14	**Write the differential equation governing the mechanical translational systems and find the transfer function. Draw the force voltage and force current electrical analogies shown in the fig.** 	C214.1	A, AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Obtain the time response of first order system when it is subjected to a unit step input.	C214.2	**U, A**
	OR		
16	Obtain the time response of the given circuit for the input Vin and output Vout.  i. What is the order of the above electric system? ii. What is the output voltage Vout at t=T?	C214.2	A, AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Subject Handling Faculty: R.Balasubramanian / Assoc. Prof / EEE & S.Sivakumar / AP / EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/Session	21-01-19/FN	Marks	50
Course code	EE8401	Course Title	Electrical Machines-II			
Batch No.		Duration	90 mins	Academic Year		2018 - 2019
Year	II	Semester/Section	IV / A & B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Name the types of alternators used in thermal and Hydro power stations.	C210.1	R
2	What are the advantages of distributed and short pitch winding?	C210.1	U
3	Why is the field system of an alternator made on rotor?	C210.1	A
4	EMF method of voltage regulation is called Pessimistic method - Why?	C210.1	U
5	Calculate the pitch factor for the under given winding: a 36 stator slots, 4-poles, coil span 1 to 8 slots.	C210.1	U
6	Define voltage regulation of an alternator.	C210.1	U
7	List the applications of synchronous motor	C210.2	U
8	What are the two fundamental characteristics of rotating magnetic field?	C210.2	E
9	State the characteristic features of synchronous motor.	C210.2	U
10	What are the causes and prevention of hunting in synchronous machines?	C210.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive the emf equation of an alternator with special care on winding factor. (10)	C210.1	U
	Or		
12	(a)A 3Φ, star connected alternator on open circuit is required to generate a line voltage of 3.4kV, 50Hz, when driven at 500 rpm. The stator has 3 slots per pole per phase and 10 conductors/slot. The coils are short chorded by one slot. Calculate (i) the number of poles and (ii) the useful flux per pole. (5) (b) Calculate the induced emf between the lines of a given 3 phase, 8 poles, 750rpm, star connected alternator having 72 slots on armature, each slot has 12 conductors and winding is short chorded by 2 slots, the flux per pole is 0.06Wb. (5)	C210.1	E
13	Explain the methods of starting of synchronous motor. (10)	C210.2	U
	Or		
14	With neat sketch draw and explain the construction details, working principles of synchronous motor (10)	C210.2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

<table>
<tr><th>Q. No.</th><th>Questions</th><th>CO</th><th>Skills</th></tr>
<tr><td>15.a</td><td>A 3 phase star connected synchronous generator is rated at 1.5MVA, 11kV.The armature effective resistance and synchronous reactance are 1.2Ω and 25Ω respectively per phase. Calculate the percentage voltage regulation for a load of 1.4375MVA at 0.8pf lagging and (ii) 0.8pf leading (iii)UPF. Also find out the power factor at which the regulation becomes zero. (5)</td><td>C210.1</td><td>E</td></tr>
<tr><td>15.b</td><td>A 1500 kVA, 6600 V,50 Hz, 3Φ star connected alternator has armature resistance of 0.4Ω and reactance of 6 ohms per phase., delivers full load current at power factor 0.8 lagging, and normal rated voltage. Estimate the terminal voltage for the same excitation and load current at 0.8 power factor leading. (5)</td><td>C210.1</td><td>E</td></tr>
<tr><td colspan="4">Or</td></tr>
<tr><td>16.</td><td>A 200 kVA, 1.1 kV, three phase , star connected alternator having effective resistance/phase of 0.62 Ohms gave the following results:
<table>
<tr><td>Field current (A)</td><td>20</td><td>35</td><td>50</td><td>80</td><td>100</td><td>120</td></tr>
<tr><td>OC terminal Voltage (V)</td><td>692.82</td><td>1120</td><td>1450</td><td>1750</td><td>1953</td><td>2180</td></tr>
</table>
Using the EMF method, calculate the percentage voltage regulation for load current of 100 A at 0.4 pf lagging ,leading and UPF. (10)</td><td>C210.1</td><td>E</td></tr>
</table>

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In Charge : Mr. P. Ramesh Babu & Dr.S.Thamizharasan

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	21.01.2019/AN	Marks	50
Course code	EE8402	Course Title	Transmission and Distribution			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/ Sec	IV/A&B	Department	EEE	

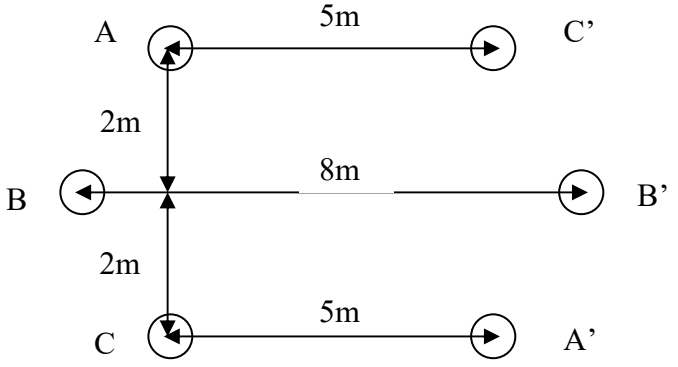
Part – A (Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the selection factors of Transmission line?	C212.1	R
2	Give reason why the transmission lines are three phase 3 wire circuits while the distribution lines are three phase 4 wire circuits.	C212.1	R
3	State skin effect in transmission line. Mention its effects on the resistance of the line	C212.1	U
4	What is transposition? Why is transmission line transposed?	C212.1	AZ
5	Define proximity effect on conductors.	C212.1	A
6	Define inductance.	C212.1	C
7	A single phase transmission line conductors are 3m apart. The diameter of each conductor is 1.63cm. Examine the inductance per km of the line.	C212.1	R
8	What will happen to the value of inductance if the no of conductors in a bundle increases?	C212.1	AZ
9	Define String Efficiency	C212.3	U
10	What are the types of insulators?	C212.3	AZ

Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive an expression for internal and external flux linkages for a conductor carrying current.	C212.1	E
	or		
12	Derive an expression for inductance of a single phase transmission line.	C212.1	R
13	An insulator string consists of three units each having a safe working voltage of 15 kV. The ratio of self-capacitance to shunt capacitance is 6:1. Determine the line voltage and string efficiency.	C212.3	C
	or		
14	Explain the types of insulators with a neat diagram.	C212.3	U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Draw and explain the structure of typical electrical power system with various voltage levels.	C212.1	R
	or		
16	A three phase double circuit line consists of 7/4.5 mm hard drawn copper conductors. The arrangement of conductors is shown in the following figure. The line is completely transposed. Calculate inductive reactance per phase per km of the system.  	C212.1	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	22.01.2019 FN	Marks	50
Course code	EI8451	**Course Title**	Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	II	**Semester/ Section**	IV	**Department**	ICE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Why is the starting torque of a dc series motor more than that of a dc shunt motor of same power rating?	C210.1	E
2	State Fleming left hand rule	C210.1	R
3	Write the emf equation of DC motor	C210.1	AZ
4	What is the significance of back emf in DC motor?	C210.1	AZ
5	Write a note on need for starter in electrical machines	C210.1	AZ
6	A 220 V dc machine has armature resistance of 0.5ohms and draws current of 20A calculate the back emf of the motor at its rated rpm.	C210.1	A
7	How to minimize iron loss in a transformer?	C210.2	R
8	Define transformation ratio of a transformer.	C210.2	R
9	Write the emf equation of transformer	C210.2	C
10	What is the difference between shell type and core type transformer?	C210.2	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the armature control and field control of speed of DC shunt motor.	C210.1	U
	Or		
12	Explain the Construction DC machines with the working principle of dc machine as generator and as motor with its emf equation.	C210.1	U
13	Describe the various types of transformer based on construction and operation. Also explain the working of transformer with its emf equation.	C210.2	U
	Or		
14	Derive the expression for the equivalent circuit parameters of single phase transformers	C210.2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A shunt generator has a F.L. current of 196 A at 220 V. The stray losses are 720 W and the shunt field coil resistance is 55 Ω. If it has a F.L. efficiency of 88%, find the armature resistance. Also, find the load current corresponding to maximum efficiency.	C210.1	E
	Or		
16	A shunt generator delivers 195 A at terminal p.d. of 250 V. The armature resistance and shunt field resistance are 0.02 Ω and 50 Ω respectively. The iron and friction losses equal 950 W. Find**(a)** E.M.F. generated **(b)** Cu losses **(c)** output of the prime motor **(d)** commercial, mechanical and electrical efficiencies.	C210.1	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I				Date/Session	23.01.2019/ AN	Marks	50
Course code	EE6604	Course Title	Design of Electrical Machines				
Batch No.		Duration	90 mins	Academic Year	2018 - 2019		
Year	III	Semester/Section	VI / A & B	Department	EEE		

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the major considerations, limitations and basic circuits to evolve the good design of an Electrical machine?	C314.1	U
2	List the methods used for determining the motor rating for variable load drives and write their equations.	C314.1	R
3	Describe the rating of electrical machine and their duty types.	C314.2	U
4	Write the equations for various modes of heat dissipation in an Electrical machine.	C314.2	R
5	Define and write the equations for Newton's law of cooling, heating time constant and cooling time constant of an Electrical machine.	C314.2	R
6	Define space factor and standard specifications of an Electrical machine.	C314.2	R
7	A field coil has a cross-section of 100X50 mm^2 and its length of mean turn is 1m. Estimate the hot spot temperature above that of the outer surface of the coil, if the total loss in the coil is 120W.Assume space factor =0.56.Thermal resistivity of insulating material=8Ωm.	C314.2	A
8	A heat radiating body can be assumed to be spherical surface with co-efficient of emissivity=0.8.The temperature of the body is 60°C and that of the walls of the room, in which it is placed, is 20°C.Find the heat radiated from the body in watt per square meter.	C314.2	A
9	Describe the separation of D and L of a DC machine.	C314.3	U
10	List the advantages and disadvantages of having maximum number of poles in a DC machine and what are the guidelines for selection of no. of poles for a DC machine?	C314.3	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	a) Explain in detail the choice of specific magnetic and electric loading of an electrical machine. (5) b) Explain the properties, material used and applications of Electrical Engineering materials. (5)	C314.1	U
	or		
12	a) A transformer core of plate width 0.5m and with a stacking factor of 0.94, has a uniformly distributed core loss of 3W/kg. The thermal conductivity of the steel is 150W/°C-m and the surface temperature is 40°C.Estimate the temperature of the hot spot if the heat flow is all to one end of the core.(ii).one half to the surface of each end. The heat flow is assumed to be along laminal. The density of steel plate is 7800kg/m3. (6) b) A field coil has a cross-section of 100X50mm2 and its length of mean turn is 1m.Estimate the hot spot temperature above that of the outer surface of the coil, if the total loss in the coil is 120W.Assume space factor=0.56.Thermal resitivity of insulating material=8Ωm. (4)	C314.1	U

	or		
13	a) Derive the output equation of a DC machine and point out the salient features. (4) b) Calculate the main dimensions of a 20HP, 1000rpm, 400V, DC motor. Given that B_{av}=0.37Wb/m^2, and ac=16,000 amp.cond/m. Assume an efficiency of 90%. (6)	C314.3	U
	or		
14	a) A 350kW, 500V, 450rpm, 6pole, DC generator is built with an armature diameter of 0.87m & core length of 0.32m. The lap wound armature has 660 conductor. Calculate the specific electric & magnetic loading. (4) a) Find the main dimensions of a 200kW, 250V, 6pole, 1000 rpm generator. The maximum value of flux density in the gap is 0.87T and the ampere conductors per meter of mature periphery are 31,000. The ratio of pole arc to pole pitch is 0.67 and the efficiency is 91%.Assume ratio of length of core to pole pitch =0.75 (6)	C314.3	U

PART-C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	a) The temperature rise of transformer is 25°C after 1 hour and 37.5°C after 2 hours of energizing from cold conditions. Calculate its final steady temperature rise and the heating time constant. If this temperature falls from the final steady state value of 40°C in 1.5 hours when it is disconnected, calculate the cooling time constant. The ambient temperature is 30°C. (6) b) A field coil has a heat dissipating surface of 0.15m^2 and a length of mean turn of 1m. It dissipates loss of 150W, the emissivity being 34W/m^2-°C. Estimate the final steady temperature rise of the coil and its time constant, if the cross-section of the coil is 100X50mm^2.Specific heat of copper is 390J/kg-°C. The space factor is 0.56.Copper weighs 8900kg/m^3. (4)	C314.2	A
	or		
16	Develop an expression for heat produced in the coil of an electrical machine considering the flow in two dimensions. (10)	C314.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In-charge : Dr.S.Thamizharasan & Mr.P.K.Arun Kumar

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/Session	22.01.19/AN	Marks	50
Course code	EE6602	Course Title	EMBEDDED SYSTEM			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/Section	VI/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Compare an embedded system and non embedded system with examples.	312.1	R
2	Define the operation of timer cum counter.	312.1	U
3	Explain the 2 essential units of a processor on an embedded system.	312.1	R
4	How to select a processor and microcontroller for an application?	312.1	R
5	What are the various forms of system memory used?	312.1	R
6	What is ICE? What for it is used?	312.1	R
7	What is deployment?	312.3	R
8	Define object oriented model	312.3	AZ
9	What are the objectives of EDLC?	312.3	R
10	What are the advantages and drawbacks of linear and iterative model?	312.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the build process of an embedded system briefly.	312.1	U
	or		
12	.(i) Describe the concept of DMAC with its block diagram(5) (ii)Explain the concept of ICE and any other device in target hardware debugging.(5)	312.1	U
13	Explain the following hardware units (a)WDT (3) (b) RTC (3) (c)Timer (4)	312.1	U
	or		
14	Explain about the functions assigned to various memories in a system.	312.1	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions		Skills
15	Explain the concept of EDLC with all it processes.	312.3	A
	or		
16.	Discuss about the various computational models in embedded design.	312.3	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: R.Vijay, AP/EEE & M.Marimuthu, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	23.01.2018/FN	Marks	50
Course code	EE6002	Course Title	POWER SYSTEM TRANSIENTS			
BATCH NO.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	III	Semester/ Section	VI / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define the term 'Power System Transient'.	C315.1	R
2.	What are the causes of power system transients?	C315.1	R
3.	Classify the transients based on its frequency.	C315.1	AZ
4.	Distinguish the lightning and switching transients.	C315.1	U
5.	Mention any two effects of transients.	C315.1	AZ
6.	Draw the transient recovery voltage (TRV) across the circuit breaker following the interruption of fault current.	C315.1	AZ
7.	What is meant by arcing ground?	C315.1	U
8.	Define restriking voltage.	C315.1	U
9.	What is meant by abnormal switching transients?	C315.1	R
10.	Mention the sources of switching transients in EHV and UHV systems.	C315.1	R

Part – B

(Answer all the questions 2 x 10 = 20marks

Q. No.	Questions	CO	Skills
11.	Explain various types of power system transients.	C315.1	R
	OR		
12.	With a suitable example, discuss the double frequency switching.	C315.1	U
13.	What are the sources and effects of transients on power systems?	C315.1	R
	OR		
14.	Derive the equivalent circuit of load switching and also its waveforms for the transient voltage across the load.	C315.1	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Derive the expression for RL circuit transient with sine wave excitation.	C315.2	AZ
	OR		
16.	Discuss in detail about the resistance switching with its equivalent circuit. Also specify the expression of voltage across the circuit breaker.	C315.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Prepared by, Dr.K.Rajkumar & Mr.B.Paranthagan

Saranathan College of Engineering

Tiruchirappalli

Internal Assessment Test - I			Date/ Session	22.01.2019/FN	Marks	50
Course code	EE6603	Course Title	POWER SYSTEM OPERATION AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2018 – 2019	
Year/	III	Semester/ Section	VI / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What is the need for frequency regulation in power system?	C313.1	U
2.	Mention the types of Load forecasting techniques.	C313.1	R
3.	What is spinning reserve?	C313.1	R
4.	Mention the significance of Load curve.	C313.1	U
5.	What is the need for load forecasting?	C313.1	U
6.	Define control area.	C313.2	R
7.	Give the conditions for synchronizing of alternators.	C313.2	A
8.	Define Load Frequency Control.	C313.2	R
9.	What is the need for integral controller in ALFC?	C313.2	U
10.	What is the advantage of AVR loop over ALFC?	C313.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	A peak demand of a generating station is 25000KW. The load factor is 60% the plant capacity factor is 50% and Plant use factor is 72%. Determine (i) daily energy produced (ii) Reserve capacity (iii) Maximum energy that could be produced according to the operating schedule.	C313.1	AZ
	OR		
12.	Discuss the overview of power system operation and control.	C313.1	U, R
13.	Explain briefly about Plant level control and system level control of power system	C313.1	R
	OR		
14.	A generating station has the following daily load cycle. Time(hrs) 0-6 6-10 10-12 12-16 16-20 20-24 Load(MW) 40 50 60 50 70 40 Draw the Load curve and Load Duration curve and find Max demand, Diversity factor, Units generated/day, Average load, Load factor.	C313.1	AZ, E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Illustrate with neat diagram the operation of speed governing mechanism and model the necessary parts.	C313.2	R, U
	OR		
16.	Two generators rated 200 MW and 400 MW are operating in parallel. The droop characteristics of their governors are 4% and 5% respectively from no load to full load. Assuming that the generators are operating at 50 Hz at no load, how would a load of 600 MW be shared between them? What will be the system frequency at this load? Assume free governor operation. Determine the load sharing between the two generators	C313.2	AZ, E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	09-03-2019/ AN	Marks	50
Course code	PX5004	Course Title	Modern rectifiers and Resonant converters			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	I st	Semester/ Section	II	Department	ME(PED)	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question
1	Define emulated resistance.
2	What is the power condition for Loss Free Rectifier?
3	What is PWM Rectifier?
4	How will be the voltage rating of power switch should be chosen for Rectifier?
5	What are the Reasons for including output side L-C filter for diode rectifiers?
6	List out the Properties of the ideal rectifier.
7	What are the different applications of rectifier.
8	What is the concept of soft switching?
9	What is the drawback in hard switching?
10	List the classification of Resonant converters.

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions
1	Realize Ideal Rectifier with proper assumptions and justify the outcome.
2	Obtain the Solution for Converter efficiency η
3	Explain with a neat sketch the L type ZCS resonant boost converter.
4	Explain with a neat sketch the L type ZVS resonant buck converter.

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions
1	The ZCS quasi resonant buck converter has an input voltage of 12v. the values of Lr and Cr are 2μH and 79nF,respectively.the average output voltage is 9V across a 9 ohm resistor. The output inductor and output capacitor are 10mH and 100μF, respectively. Determine (a) the switching frequency, (b) the duration that the resonant inductor is charged, (c) the peak current in the resonant inductor and voltage across resonant capacitor.

Faculty In charge:S.Sivakumar /AP/EEE/SCE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	07/03/2019&AN	Marks	50
Course code	PX 5201	**Course Title**	Analysis and Design of Inverter			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	I	**Semester/ I Sec**	MEPED	**Department**	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is the ratio between third harmonic content to the fundamental in the line voltage of three phase Voltage Source Inverters?	C110.2	R
2	Mention the advantages of Space Vector Modulation.	C110.2	R
3	What is the drawback of operating three phase inverter in 120 degree mode?	C110.2	E
4	What do you mean by space vector modulation?	C110.2	R
5	Write the expression for output line-line voltage (peak) in a 120 degree mode on Inverter.	C110.2	R
6	Mention some PWM techniques used for output voltage control in a three phase Inverter.	C110.2	R
7	State the advantages and disadvantages of multi Pulse Width Modulation.	C110.2	R
8	Draw the output phase voltage waveform of Inverter operating in 120 degree conduction mode?	C110.2	R
9	Why should normalized carrier frequency of a three phase inverter be an odd multiple of three?	C110.2	R
10	In a voltage source inverter , the shape of the load current depends on the load parameters .Give reason.	C110.2	E

Part – B
(Answer all the questions 2 x 10 = 20marks) Maximum 2 splits/Question

Q. No.	Questions	CO	Skills
11a	What is pulse width modulation ? List the various pulse width modulation techniques. How do these differ from each other ? (3)	C110.2	R
11 b	Explain space vector modulation used in inverters .Write the important features of the same. (7)	C110.2	R
	or		
12	Explain the principle of operation of three phase Inverter operating at 180 degree conduction mode with star connected load, with neat waveforms and circuit diagram.	C110.2	AZ
13	Explain the principle of operation of three phase Inverter operating at 120 degree conduction mode with star connected load, with neat waveforms and circuit diagram.	C110.2	AZ
	or		
14	With suitable diagrams, explain the multi Pulse Width Modulation technique used to control output voltage of three phase Inverter.	C110.2	R

Part – C

(Answer all the questions 1 x 10 = 10marks) Case study or Analytical type

Q. No.	Questions	CO	Skills
15	A three phase Bridge Inverter delivers power to a resistive load from a 450 V source. For a star connected load of 10 ohm/phase, determine for both 120 degree mode operation. i. RMS value of load current ii. RMS value of thyristor current iii. Load power	C110.2	AZ
	or		
16	A three phase Bridge Inverter delivers power to a resistive load from a 450 V source. For a star connected load of 10 ohm/phase, determine for both 180 degree mode operation. i. RMS value of load current ii. RMS value of thyristor current iii. Load power	C110.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirappalli

Internal Assessment Test - II			Date/Session	09/03/2019 (FN)	Marks	50
Course code	PS5071	**Course Title**	Distributed Generation and Microgrid			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year	II	**Semester/Section**	II / A	**Department**	ME-PE&D	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define power quality.	C113.3	U
2	What is cogeneration?	C113.2	R
3	State the limits of voltage on grid connection.	C113.3	R
4	List the requirements of grid interconnection.	C113.3	R
5	Define captive power plant.	C113.2	U
6	State how fly wheel is used as energy storage elements.	C113.2	U
7	What is THD?	C113.3	U
8	List the parameters that response to abnormal Grid conditions.	C113.3	U
9	List the impact of DG on voltage Regulation.	C113.3	R
10	Explain grid interconnection in distributed generation.	C113.3	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain in detail the basic requirement for grid interconnection and the limits on operating parameters.	C113.3	U
	or		
12	Discuss on terms of reliability, stability and power quality issues on the impact of grid interconnection with NCE sources.	C113.3	U
13	Explain with a neat sketch, the working principle of battery.	C113.2	U
	or		
14	Describe the principle and working of Ultra-capacitors as energy storage elements in distributed generations.	C113.2	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain in detail the impact of DG on harmonics.	C113.3	R
	or		
16	Discuss about the captive power plant in detail	C113.3	C

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name:Ms.C.PearlineKamalini AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/ Session	08.03.19/ FN	Marks	50
Course code	PX5252	**Course Title**	Power Quality			
Batch No.		**Duration**	90 mins	**Academic Year**	2018-2019	
Year	I	**Semester/ Section**	II	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define power factor in terms of displacement and distortion factor.	C111.2	U
2	Distinguish between the Three phase balance and unbalanced system	C111.2	AZ
3	What are three levels of possible solutions to voltage sag and Momentary interruption problems?	C111.3	R
4	What is load balancing problem ?	C111.3	R
5	Define active series compensation devices.	C111.3	U
6	Name any four types of sag mitigation devices.	C111.3	R
7	What is current balancing?	C111.3	U
8	How the Fundamental sequence component helps in compensation?	C111.3	AZ
9	List some IEEE Standards Associated with Voltage Sags.	C111.3	A
10	Define instantaneous real power.	C111.3	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Discuss about Single phase sinusoidal, non sinusoidal source supplying linear and nonlinear loads .	C111.2	U&A
	OR		
12	Explain the concept of power factor with its consequences . Illustrate how the power factor can be improved with a capacitor. Use phasor diagram analysis.	C111.2	U&AZ
13	What is Harmonics and Explain about the Harmonic Sources from Commercial and Industrial Loads.	C111.3	U
	OR		
14	Explain Effects of Harmonics and how to control Harmonics in Electrical Power Systems.	C111.3	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain in detail about Open and closed loop balancing.	C111.3	U
	OR		
16	Explain the load compensation using instantaneous real and reactive power method.	C111.3	U&A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	07.03.2019 / FN	Marks	50
Course code	PX5202	Course Title	SOLID STATE DRIVES			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	I- M.E (PED)	Semester/ Section	II	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions
1	List the converters used to perform four quadrant operations in DC motor.
2	What are the advantages of operating choppers at high frequency?
3	What is Time ratio Control and Current limit control?
4	What is the function of current limiter?
5	Explain the advantages of closed loop control.
6	Draw the circuit diagram of class E chopper for DC machine control
7	Write down the transfer function expression of converter.
8	Compare speed control of induction machine from stator and rotor side
9	List the various AC voltage controller circuits for 3 phase induction machine
10	Distinguish VSI and CSI fed induction motor

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q.No.	Questions
11	Explain in detail the chopper control of separately excited dc motor under motoring mode and Regenerative breaking mode
	Or
12	Describe the operation of a four quadrant chopper fed separately excited DC motor with neat diagram.
13	Explain from basic principles six step inverter voltage control for the 3 phase induction machine.
	Or
14	Discuss using a diagram the operation of a CSI fed variable frequency drives

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions
15	A 220 volts, 1500 rpm, 10 Amps separately excited dc motor has an armature resistance of 0.5 Ω is fed from a three phase fully controlled rectifier. Available AC source has a line voltage of 400 volts, 50 Hz. A star-delta connected transformer is used to feed the armature so that motor terminal voltage equals rated voltage when converter firing angle is zero. Calculate transformer turns ratio. Determine the value of firing angle when a. Motor is running at 1200 rpm and rated torque b. When motor is running at (-800 rpm) and twice the rated torque. Assume continuous conduction.
	Or
16	A 230 volts, 960 rpm, 200 Amps separately excited DC motor has an armature resistance of 0.02 Ω. The motor is fed from a dc source of 230 volts through a chopper. Assuming continuous conduction a)Calculate the duty ratio of chopper for monitoring operation at rated torque and 350 rpm b) If maximum duty ratio of chopper is limited to 0.95 and maximum permissible motor speed obtainable without field weakening

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - 2			Date/ Session	08/03/2019/AN	Marks	50
Course code	PX5251	**Course Title**	Special Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 – 2019	
Year/Branch	I Year M.E(PED)	**Semester**	II	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	
1	What is switched reluctance motor?
2	Why rotor position sensor is essential for the operation of SRM?
3	Draw λ-I curve of Switched Reluctance Motor.
4	What is meant by energy ratio?
5	Draw the simple block diagram of SRM
6	Draw the torque - speed characteristics of SRM
7	What are the modes of operation of SRM
8	What are the two types of control techniques in SRM
9	List the applications of SRM
10	Distinguish between SRM and Stepper motor.

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	
11.	Explain in detail construction and working principle of SRM
	(or)
12	Derive the voltage equation of SRM
13.	Discuss the various modes of operation of SRM
	(or)
14.	Draw and explain the torque – speed characteristics of SRM

Part – C

(Answer all the questions 2 x 10 = 20marks)

Q. No.	
15.	Discuss the various converter topologies for a 3 phase SRM with merits and demerits of each.
	(or)
16.	Derive the static torque equation of SRM neglecting magnetic saturation.

Name of the faculty : P. Ramesh Babu/Dept . of EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	08.03.19 / FN	Marks	50
Course code	BE8253	Course Title	Basic Electrical, Electronics and Instrumentation Engineering			
Batch No.		Duration	90 mins	Academic Year	2018-19	
Year/	I	Semester/ Section	II/ A&B	Department	Mechanical Engineering	

Part – A

(Answer all the questions 10 × 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write the Relationship between Line and Phase parameters of a three phase balanced star connected system.	c112.2	R
2	A Washing Machine of 500 Watts, 0.85 power factor is connected with an AC supply of 230 V, 50 Hz. Calculate the current in the circuit.	c112.2	A
3	Define form factor and write the form factor of a sinusoidal waveform.	c112.2	A
4	Mention the advantages of AC supply over DC supply.	c112.2	R
5	A series RLC circuit has R=25Ω, L=0.221H, and C=66.3μF with frequency of 60Hz. Find the power factor.	c112.2	A
6	Define RMS value.	c112.2	R
7	What are the three types of power used in three phase AC circuit?	c112.2	U
8	What is the purpose of yoke in a D.C machine?	c112.3	R
9	Write the EMF equation of a D.C. Generator.	c112.3	R
10	List the applications of D.C. generator.	c112.3	R

Part – B

(Answer all the questions 2 × 10 = 20marks)

Q. No.	Questions	CO	Skills
11a	Derive the expressions for current, impedance, phase angle, power factor, real and reactive power of R-L and R-L-C circuits.	c112.2	A
	OR		
11b	Obtain the expression for power and power factor of three phase A.C. star connected balanced load.	c112.2	A
12a	Explain the construction and working principle of operation of DC Generator with neat sketch**.**	c112.3	A
	OR		
12b	Explain the characteristics of different types of dc generators.	c112.3	A

Part – C

(Answer all the questions 1 × 10 = 10marks)

Q. No.	Questions	CO	Skills
13a	(i) A coil takes a current of 6 A when connected to a 24 V dc supply. To obtain the same current with a 50 Hz ac supply, the voltage required is 30 V. Calculate i. Inductance of the coil ii. Power factor of the coil. (5) (ii) A coil of resistance 5.94 Ω and inductance of 0.35 H is connected in	c112.2	A

	series with a capacitance of 35 μF across a 200 V, 50 Hz supply. Find the impedance, current and the phase difference between voltage and current. (5)		
	OR		
13b	Three inductive coils, each with a resistance of 15 Ω and an inductance of 0.03 H are connected to a three phase 400 V, 50 Hz supply. Calculate the phase current, line current and power absorbed for (i) Star connected system (ii) Delta connected system	c112.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	08.03.19 /FN	Marks	50
Course code	BE8255	Course Title	Basic Electrical, Electronics & Measurement Engineering			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	I	Semester/ Section	II	Department	CSE(A&B)/IT	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the causes of failure of dc shunt generator to excite?	C112.3	R
2	A 4-pole, wave wound generator has 51 slots and 20 conductors are placed per slot. Find the generated emf when the generator is driven at 1500 rpm and flux is 7mwb.	C112.3	AZ
3	Write down the speed equation & torque equation of a DC motor.	C112.3	AZ
4	Why transformers are rated in kVA?	C112.3	R
5	Define slip of an induction motor.	C112.3	U
6	Define static and dynamic characteristics of an instrument	C112.6	R
7	Define static error and how it is classified.	C112.6	R
8	Define transducer.	C112.6	R
9	Mention different types of strain gauges.	C112.6	R
10	What is piezoelectric effect?	C112.6	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	With a neat sketch, explain the working principle and construction of DC generator.	C112.3	R
	or		
12	(i)Derive the emf equation for an alternator.(5) (ii)Derive the torque equation for three phase induction motor.(5)	C112.3	R
13	Explain the static and dynamic characteristics of measurement system.	C112.6	U
	or		
14	Create the circuit and explain the following instruments (i) Strain gauge.(5) (ii) LVDT for Linear displacement measurement. (5)	C112.6	U
	Part – C(Answer all the questions 2 x 10 = 20marks)		
15	With a neat sketch, explain the working principle and construction of stepper motor.	C112.3	R
	or		
16	A 15 KVA, 2000/200 V transformer has an iron loss of 250W and full load copper loss 3500W. During the day, it is loaded as follows: No. of hours / load / Power factor 9 / 1/4 / 0.6 7 / Full load / 0.8 6 / 3/4 / 1 2 / No load / - Calculate the all day efficiency.	C112.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff name: M.Marimithu(I-CSE"A") , N.Karthika (I-CSE"B"), N.Vijayasarathi (I-IT)

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – II			Date/Session	15.03.18/FN	Marks	50
Course code	BE8251	Course Title	BASIC ELECTRICAL AND ELECTRONICS ENG.			
Batch No.		Duration	90 mins	Academic Year	2017 - 2018	
Year	I	Semester/Section	II/A	Department	CIVIL	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Mention few application of DC GENERATOR	112.2	R
2	What do you mean by biasing?	112.4	R
3	Define Back emf.	112.2	U
4	Why single phase induction motor is not self starting motor?	112.3	U
5	Define Ripple factor	112.4	U
6	Draw the circuit for various types of DC motor	112.2	U
7	Write down the EMF equation of Transformer	112.3	A
8	List out the types of Single phase induction motor	112.3	AZ
9	Calculate the EMF generated by a 4 pole wave wound armature having 45 slots with 18 conductors per slot when driven at 1200 rpm.The flux per pole is 0.012wb	112.2	U
10	Give some application of DC Motor.	112.2	AZ

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Explain the operation of CE,CB,CC Configuration of BJT.	112.5	A
	Or		
12	Explain in detail Full wave Rectifier		A
13	Construction and working Principle of Transformer.	112.5	U
	Or		
14	Explain the working principle of single phase induction motor&Discuss any two types	112.5	U
15	Draw and Explain the Characterstics of PN Junction diode	112.4	U
	Or		
16.	Explain in detail Half wve rectifier.	112.4	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Saranathan College of Engineering Tiruchirapalli

Internal Assessment Test – II			Date/ Session	09/03/2019/ FN	Marks	50
Course code	EE8251	**Course Title**	CIRCUIT THEORY			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	I	**Semester/ Sec**	02/A&B	**Department**	EEE	

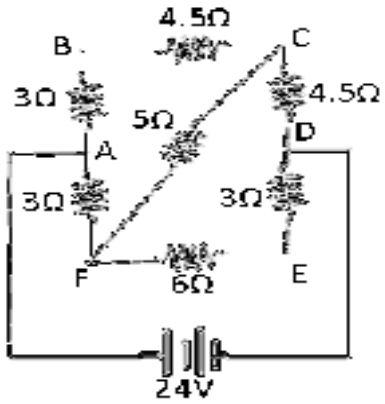
Part – A

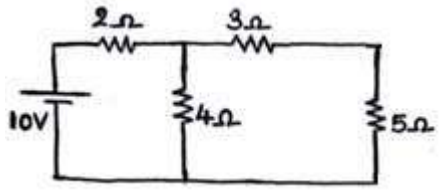
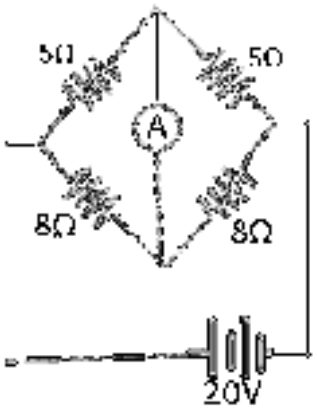
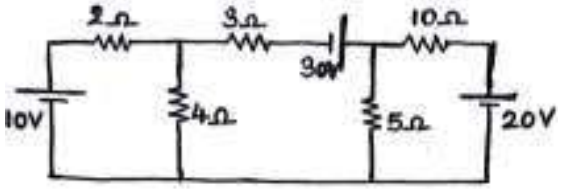
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Maximum Power Transfer theorem	C113.3	R
2	Draw the Norton's Equivalent circuit	C113.3	C
3	Distinguish between Balanced and Unbalanced Load	C113.3	U
4	State Thevenins Theorem	C113.3	R
5	State reciprocity theorem	C113.3	R
6	State the condition for Maximum Power transfer in DC circuit and some applications of it.	C113.3	A
7	What is phase sequence.	C113.6	U
8	In three phase circuit, what do you mean by balanced load?	C113.6	AZ
9	What are the advantages of three phase system.	C113.6	U
10	Define Line voltage and Phase voltage	C113.6	AZ

Part – B

(Answer all the questions 3 x 10 = 30marks)Maximum 2 splits/Question

Q. No.	Questions	CO	Skills
11	Calculate using thevenin's theorem the current through the branch FC. 	A	C113.3
	or		
12	For the circuit shown, verify reciprocity theorem	A	C113.3

			
13	In the circuit of the fig, compute the current through the ammeter. Use Norton's theorem 	A	C113.3
	or		
14	Use Maximum power transfer Theorem. Find the value of resistance for which maximum power is transferred across 5ohm.(RL) 	A	C113.2
15	Derive the current, voltage and power equation for the balanced star connected system.	AZ	C113.6
	or		
16	A Balanced star connected load of impedance 8+8jΩ per phase is connected to a 3 phase 230V,50Hz supply.Find Real, Reactive Powers and Total VoltAmperes.	E	C113.6

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	14.02.2019 /AN	Marks	50
Course code	EI8451	**Course Title**	Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	II	**Semester**	IV	**Department**	ICE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the main losses in a transformer?	C210.3	E
2	What is meant by regulation of a transformer?	C210.3	R
3	What advantage is obtained in delta connection of three phase transformer?	C210.3	AZ
4	What are the types of transformers used for measurement	C210.3	E
5	Define RMF	C210.4	AZ
6	An alternator has 6 poles and runs at 1000 rpm. What is the frequency of generated emf in it?	C210.4	E
7	Define distribution factor and coil span factor.	C210.4	R
8	Define torque angle	C210.4	R
9	Write expression for EMF in synchronous machine	C210.4	AZ
10	For a 6 pole machine, 6 slots per pole per phase and each slot carries 15 conductors. Find the Zph. And Tph.	C210.4	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain working of the transformers used for measuring the high voltage and high current.	C210.3	U
	Or		
12	Draw the phase diagram of transformers and explain the regulation and efficiency of transformer	C210.3	E
13	Explain the construction and working principle of three phase alternator.	C210.4	U
	Or		
14	Derive the EMF equation of three phase alternator. Describe the procedure to obtain V-curves of synchronous motor	C210.4	E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Describe briefly about why the synchoronous motors are inherently not self starting. Explain any two methods of starting of synchoronous motor.	C210.4	U
	Or		
16	A 64 pole, 50Hz, three phase star connected alternator has 3 slots per pole/phase. There are four conductors per slot. A flux of 0.05 wb/pole is distributed sinusoidally across the air gap. Find conductors per phase, distribution factor, speed and induced emf.	C210.4	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	13.02.2019 /AN	Marks	50
Course code	EE8401	**Course Title**	Electrical Machines-II			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 – 2019	
Year/	II	**Semester/ Section**	IV/A&/B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	When is a synchronous motor receiving 100% excitation?	C210.2	U
2	What is the role of synchronous motor in a transmission line?	C210.2	R&U
3	What are V-curves?	C210.2	AZ
4	How can change the operating speed of synchronous motor?	C210.2	U
5	What is the effect of increase in excitation of a synchronous motor?	C210.2	U
6	How can the direction of rotation of three phase induction motor be reversed?	C210.3	R
7	Write down the advantages of slip ring induction motor.	C210.3	U
8	What are the purposes that could be served by external resistors connected in the rotor circuit of phase wound induction motor?	C210.3	U
9	What are the advantages of skewing the rotor slots?	C210.3	U
10	What happen when $N=N_s$ in three phase induction motor?	C210.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain briefly how a synchronous motor can be operated as a synchronous condenser. (4)	C210.2	AZ
11 b	Derive the expression for power delivered by a synchronous motor in terms of load angle. (6)	C210.2	U, AZ, A, E
	Or		
12a	A 5kw, three phase star-connected 50 Hz, 440 V, cylindrical rotor synchronous motor operates at rated condition with 0.8 power factor leading. The motor efficiency excluding field and stator losses is 95% and X_s= 2.5Ω. Calculate (i) Mechanical power developed (ii) Armature current (iii) Back emf (iv) Power angle (v) Maximum or pull out torque of the motor. (4)	C210.2	U, AZ, A, E
12b	Enumerate in detail the effect of varying excitation on armature current and power factor of synchronous motor. (6)	C210.2	U, AZ, A, E
13	Describe in detail, the working principle of three phase induction motor. Compare slip ring and squirrel cage rotor.	C210.3	U, AZ, A, E
	Or		
14 a	Explain slip-torque characteristics of three phase induction motor. Derive the condition for maximum torque. (6)	C210.3	U
14 b	Derive the equivalent circuit of three phase induction motor. (4)	C210.3	R&U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A 1100V, 50 Hz delta connected induction motor has a star connected slip rings rotor with a phase transformation ratio of 3.8(stator/Rotor). The rotor resistance and standstill leakage reactance are 0.012 and 0.25 per phase respectively. Neglecting stator impedance and magnetizing current determine. (i) rotor current at start with slip-ring shorted (ii) the rotor power factor at start with slip-rings shorted (iii) the rotor current at 4% slip with slip ring shorted (iv) The rotor power factor at 4% slip with slip ring shorted (v) the external rotor resistance per phase required to obtain a starting current of 100A in the stator supply lines.	C210.3	E
	or		
16	A 6-pole, 50Hz, 3-phase induction motor has a rotor resistance of 0.25 per phase and a maximum torque of 10 N-m at 875 rpm. Calculate (a) the torque when the slip is 5%, and (b) the resistance to be added to the rotor circuit to obtain 60% of the maximum torque at starting. Explain why two values are obtained for this resistance. Which value will be used? The stator impedance is assumed to be negligible.	C210.3	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Prepared by Dr.S.Thamizharasan & Mr.P.Rameshbabu

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Tiruchirapalli

Internal Assessment Test – II			Date/ Session	14.02.19/ AN	Marks	50
Course code	EE8403	**Course Title**	Measurements and Instrumentation			
Batch No.		**Duration**	90 mins	**Academic Year**	2018-2019	
Year	II	**Semester/ Section**	IV / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the different methods of measurement of frequency in the power frequency range?	C212.2	R
2	Explain why it is necessary to make the potential coil circuit purely resistive in watt meters.	C212.2	A
3	What are the advantages of digital instruments over analog instruments?	C212.2	R
4	Define Resolution of DVM	C212.2	R
5	Define nominal ratio of instrument transformers.	C212.2	U
6	Explain the following term as applied to digital displays 3 ½ digit and 4 ½ digit displays.	C212.2	U
7	What is potentiometer?	C212.3	U
8	What is a bridge circuit?	C212.3	U
9	Draw the Wheatstone bridge and write the balancing equation for Wheatstone bridge.	C212.3	U
10	What are the advantages of bridge circuit?	C212.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the working of Dual slope integrating type DVM	C212.1	U
	OR		
12	Explain the working of Successive Approximation type DVM.	C212.1	U
13	Explain the working of two wattmeter method (Delta connection) for three phase power measurement. Also derive two wattmeter method for a balanced star connected load.	C212.2	A
	OR		
14	a. Explain the working digital frequency meter. (5) b. Explain the working of digital phase meter. (5)	C212.2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the operation of Wheatstone bridge. What are the advantages of the bridge circuit.	C212.3	AZ
	OR		
16	Explain the operation of Kelvin's Double bridge.	C212.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

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Internal Assessment Test – II			Date/Session	15-02-19 / AN	Marks	50
Course code	IC8451	Course Title	CONTROL SYSTEMS			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/Section	04 / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are transient and steady state response of a control system?	C214.2	R
2	Define Settling time	C214.2	R
3	Define rise time	C214.2	R
4	What are the effects of damping ratio on the time response of a second order system?	C214.2	U
5	What is type number and order of a system? What is its significance?	C214.2	R
6	What is steady state error? Define static error constants.	C214.2	R
7	State the rule for obtaining the breakaway point in root locus.	C214.3	U
8	What is the magnitude and angle condition for a root to lie on a root locus sketch?	C214.3	R
9	Point out the drawbacks in transfer function model analysis.	C214.3	R
10	What do you mean by Controllability and Observability?	C214.6	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	The unity feedback system is characterized by an open loop transfer function $G(s) = \frac{K}{S(S+10)}$. Determine the gain K, so that the system will have a damping ratio of 0.5. For this value of K, determine settling time, rise time, peak overshoot and time to peak overshoot for a unit step input. Also determine its output response c (t) for unit step input.	C214.2	E
	(OR)		
12	A unity feedback system has the forward transfer function $G(s) = \frac{10(S+2)}{S^2(S+1)}$. The input $r(s) = \frac{3}{S} - \frac{2}{S^2} + \frac{1}{3S^3}$ is applied to the system. Determine the steady state error and static error constants.	C214.2	E
13	Sketch the root locus for the open loop transfer function of unity feedback control system given below: G(S) H(S)= $\frac{K}{S(S+2)(S+4)}$. Find the value of K at which the locus sketch crosses the imaginary axis.	C214.3	E
	(OR)		
14	Draw the root locus of the following system. G(S)=K(S+3)/S(S+1)(S+2)(S+4)	C214.3	E
	PART – C (Answer all the questions 1 x 10 = 10marks)		
15	Test whether the given system is controllable & observable.	C214.6	C

	$\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\\ \dot{x}_3\end{bmatrix} = \begin{bmatrix}-6 & -11 & -6\\ 1 & 0 & 0\\ 0 & 1 & 0\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\end{bmatrix} + \begin{bmatrix}1\\ 0\\ 0\end{bmatrix} u$ $y = \begin{bmatrix}0 & 1 & 3\end{bmatrix}\begin{bmatrix}x_1\\ x_2\\ x_3\end{bmatrix}$		
(OR)			
16	**Test whether the given systemis controllable &observable.** $\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\\ \dot{X}_3\end{bmatrix} = \begin{bmatrix}2 & -2 & 3\\ 1 & 1 & 1\\ 1 & 3 & -1\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix} + \begin{bmatrix}11\\ 1\\ -14\end{bmatrix}\begin{bmatrix}u\end{bmatrix}$ $Y = \begin{bmatrix}-3 & 5 & -2\end{bmatrix}\begin{bmatrix}X_1\\ X_2\\ X_3\end{bmatrix}$	**C214.6**	**AZ**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty name: R.Balasubramanian & S.Sivakumar

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	13.01.2019/FN	Marks	50
Course code	EE8402	Course Title	Transmission and Distribution			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/ Sec	IV/A&B	Department	EEE	

Part – A (Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write the expression for capacitance of a single phase line considering the effect of earth.	C212.1	R
2	What is meant by insulator flashover?	C212.1	U
3	List the methods to improve string efficiency.	C212.1	R
4	Name the tests performed on an insulator.	C212.1	R
5	Mention the various types of cable based on number of cores.	C212.1	R
6	What is the necessity of armour in cables?	C212.1	U
7	Justify why the capacitance of cable is much higher than OH line.	C212.1	A
8	A single core cable 1.7 km long, has a conductor radius of 13 mm and an insulation thickness of 5.8 mm. The dielectric has a relative permittivity of 2.8. Find the capacitance per meter length of cable.	C212.1	AZ
9	List four properties of a cable.	C212.3	R
10	Mention the methods of grading the cables.	C212.3	R

Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive an expression for capacitance of a three phase asymmetrically spaced over head line.	C212.1	U
	or		
12	A 220kV, 50 Hz, 200 km long 3-ph transmission line has its conductors horizontally spaced with 6m between adjacent conductors and 12 m between outer conductors. Find the capacitance per phase, reactance per phase, charging current per phase and total charging MVA of the line if radius of each conductor is 1.81 cm.	C212.1	AZ
13	A string of 8 suspension insulators is to be graded to obtain uniform distribution of voltage across the string. If the capacitance of the top unit is 10 times the capacitance to ground of each unit, determine the capacitance of the remaining seven units.	C212.3	AZ
	or		
14	Each line of a 3-phase system is suspended by a string of 3 identical insulators of self capacitance C farads. The shunt capacitance connecting metal work of each insulator is 0.2C to earth and 0.1C to line. Calculate the string efficiency of the system if the guard ring increases the capacitance between the line and metal work of the lowest insulator to 0.3C.	C212.3	AZ

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Derive an expression to find the capacitance of 3 core belted cable.	C212.1	R
	or		
16	A 2 km long 3 core 3 phase cable has capacitance 0.5 μF/km between two conductors bunched with sheath and the third conductor. The capacitance between the conductors is also measured when bunched together and the sheath and found to be 0.75 μF/km. Determine (i) Effective per phase capacitance, (ii) Capacitance between two conductors connecting third conductor to the sheath and (iii) Charging current if the supply voltage is 11 kV, 50 Hz.	C212.1	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

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Internal Assessment Test - II			Date/ Session	13-02-2019/ AN	Marks	50
Course code	EE6601	**Course Title**	Solid State Drives			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 - 2019	
Year/	III rd	**Semester/ Section**	VI / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skils
1	List the classifications of controlled fed DC drives.	C311.2	AZ
2	It is required to implement a chopper fed control of a 12 V DC motor. Which power electronic switch (IGBT or MOSFET) is preferred? Why?	C311.3	AZ
3	List the converters used to perform four quadrant operations in DC motor.	C311.2	U
4	Distinguish circulating current mode and Non-circulating current mode?	C311.2	A
5	What is Time ratio Control and Current limit control?	C311.3	U
6	Draw the block diagram of current limit control	C311.6	U
7	Explain the advantages of closed loop control.	C311.6	U
8	List the methods of speed sensing.	C311.6	U
9	Write down the transfer function expression of converter.	C311.6	R
10	Give the advantages of PI controller.	C311.6	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	CO	Skills
11a	Explain in detail the chopper control of separately excited dc motor under motoring mode and Forward braking mode	C311.3	R
11 b	Discuss the different control techniques of chopper in detail.	C311.3	R
	or		
12	Describe the operation of a four quadrant chopper fed separately excited DC motor with neat diagram.	C311.3	R
13	Derive and explain from basic principles the transfer function for separately excited DC motor load system?	C311.6	R
	or		
14	Discuss using a diagram the operation of a closed loop scheme for speed control of a DC motor, below and above the base speed.	C311.6	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	CO	Skills
15	A 220 volts, 1500 rpm, 10 Amps separately excited dc motor has an armature resistance of 0.5 Ω is fed from a three phase fully controlled rectifier. Available AC source has a line voltage of 400 volts, 50 Hz. A star-delta connected transformer is used to feed the armature so that motor terminal voltage equals rated voltage when converter firing angle is zero. Calculate transformer turns ratio. Determine the value of firing angle when a) Motor is running at 1200 rpm and rated torque b) When motor is running at (-800 rpm) and twice the rated torque. Assume continuous conduction.	C311.2	A
16	a) A 220 V, 24 A, 1000 RPM, separately excited DC motor has an armature resistance of 2 ohms. Motor is controlled by a chopper with frequency of 500 Hz and source voltage of 230 V. Calculate the duty ratio for 1.2 times rated torque and 500 RPM. b) (i) A 220 V, 1500 RPM, 10 A separately excited dc motor is fed from a single phase semi converter with an ac source voltage of 230 V, 50 HZ. Ra=0.2 ohms. Conduction can be assumed continuous. Calculate the firing angle for half the rated torque at 500 RPM	C311.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge: C.Pearline Kamalini /AP/EEE/SCE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/Session	14.02.19/FN	Marks	50
Course code	EE6602	Course Title	EMBEDDED SYSTEM			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/Section	VI/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is I2C? What are its applications?	312.2	R
2	Distinguish between serial and parallel ports with example.	312. 2	U
3	Difference between synchronous and asynchronous communication.	312. 2	R
4	List out the 4 frames in CAN bus.	312. 2	R
5	What is the need for device drivers?	312. 2	R,A
6	What are the applications of SPI and CAN?	312. 2	R
7	What is UART ?and write its features.	312. 2	R
8	What are the components included in smart card?	312.5	AZ,R
9	Define context switching.	312.5	R
10	Mention some examples for automotive application and explain why it is said so.	312.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(i)Explain about RS-422 and RS-485 communication protocols.(6) (ii)Explain about RS-232 communication protocol.(4)	312.2	U,R
	or		
12	Explain the following terms in detail (i)SPI. (ii)CAN.	312.2	U,A,R
13	Explain the types of serial communication protocols with examples.	312.2	U,R
	or		
14	(i)Brief about the interfacing cable which supports full duplex communication.(6) (ii) Explain the concept of I2C and describe its interface. (4)Explain the types of serial communication protocols with examples.	312.2	U,A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions		Skills
15	Explain the case study of washing machine with its specification.	312.5	AZ
	or		
16.	Explain the case study of smart with its specification.	312.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: R.Vijay, AP/EEE & M.Marimuthu, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	15.02.2019/FN	Marks	50
Course code	EE6604	**Course Title**	Design of Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 – 2019	
Year/	III	**Semester/ Section**	VI/A&B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	List the factors governing the length of armature core in dc machine.	C314.3	U
2	Why square pole is preferred?	C314.3	R
3	What are the factors to be considered in the design of commutator?	C314.3	R
4	Define gap contradiction factor for slots.	C314.3	AZ
5	State the relation between the armature diameter and commutator diameter for various rating of dc machines.	C314.3	R
6	Define commutator pitch.	C314.3	R
7	Define window space factor.	C314.4	R
8	Why stepped cores are used in the transformers?	C314.4	R
9	What is the range of current densities used in the design of transformer winding?	C314.4	AZ
10	Give the relationship between emf per turn and KVA rating in a transformer.	C314.4	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Calculate the apparent flux density at a particular section of a tooth from the following data: Tooth width = 12mm; slot width = 10mm; gross core length = 0.32m; number of ventilating ducts = 4, each 10mm wide; real flux density = 2.2Wb/m^2; permeability of teeth corresponding to real flux density = 31.4 x 10^{-6} H/m; stacking factor =0.9. (5 Marks)	C314.3	AZ
11 b	Design a suitable commutator for a 350 kW, 600 rpm, 440V, 6 pole DC generator having an armature diameter of 0.75m. The no. of coils is 288. Assume suitable values wherever necessary. (5 marks)	C314.3	U, AZ, A, E
	Or		
12	A 4-pole, 400V, 960 rpm, shunt motor has an armature of 0.3m in diameter and 0.2m in length. The commutator diameter is 0.22m. Give full details of suitable winding including the number of slots, number of commutator segments and number of conductors in each slot for an average flux density of approximately 0.55wb/m^2 in the air-gap.	C314.3	U, AZ, A, E
13	Derive the output equation of 1Φ and 3Φ transformer in terms of core area and window area.(10 marks)	C314.4	U, AZ, A
	Or		
14 a	Determine the dimensions of the core, the number of turns, the cross-section of conductors for a 5KVA, 11000/400V, 50Hz, single phase core type distribution transformer. The net conductor area in the window is 0.6 times the net cross-section of iron in the core. Assume a square cross-section for the core, a flux density of 1 Wb/m^2, current density 1.4A/mm^2, and a window space factor 0.2. The height of window is 3 times its width.	C314.4	AZ, U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A 250 kVA, 6600/400 V, 3Φ core type transformer has a total loss of 4800 W at full load. The transformer tank is 1.25m in height and 1m x 0.5m in plan. Design a suitable scheme for tubes if the average temperature rise is to be limited to 35°C. The diameter of tubes is 50mm and spaced 75mm from each other. The average height of the tube is 1.05m. Specific heat dissipation due to radiation and convection is respectively 6 and 6.5 W/m^2-°C. Assume that convection is improved by 35 percent due to provision of tubes.(10 Marks)	C314.4	U, AZ, A, E
	Or		
16(a)	Estimate the main dimensions, window area, number of turns and the conductor area of a three phase, delta-star core type transformer rated at 300kVA, 6600V/440V, 50Hz. A suitable core with 3-steps having a circumscribing circle of 0.25m diameter and a leg spacing of 0.4m is available. EMF per turn= 8.5V, current density= 2.5A/mm^2, window space factor= 0.28, stacking factor= 0.9. (5 marks)	C314.4	U, AZ, A, E
16(b)	A 3-phase, 50 Hz, oil cooled core type transformer has the following dimensions: distance between core centers= 0.2m, height of window= 0.24m. Diameter of circumscribing circle= 0.14m. The flux density in the core= 1.25wb/m^2, the current density in the conductor= 2.5A/mm^2. Assume a window space factor of 0.2 and the core area factor= 0.56. The core is 2 stepped. Estimate the KVA rating of the transformer. (5 marks)	C314.4	U, AZ, A, E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

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Panjappur, Tiruchirappalli - 620012

Internal Assessment Test – II			Date / Session	**14.02.2019/AN**	Marks	**50**
Course code	**EE6603**	Course Title	**POWER SYSTEM OPERATION AND CONTROL**			
Batch No		Duration	**90 minutes**	Academic Year		**2018 – 2019**
Year	**III**	Semester / Section	**VI / A & B**	Department		**EEE**

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What is the use of secondary loop?	C313.2	R
2.	What are the functions of ALFC?	C313.2	U
3.	Draw the transfer function model of the single area controlled system	C313.2	AZ
4.	Mention the various controllers for secondary feedback in LFC.	C313.2	R
5.	Distinguish between primary and secondary feedback loops in LFC.	C313.2	AZ
6.	What is the function of exciter?	C313.3	U
7.	When is feedback stability compensation used?	C313.3	R
8.	State the main objectives of reactive power and voltage control in power systems.	C313.3	U
9.	What is Static VAR Compensator?	C313.3	R
10.	Mention the types of excitation schemes.	C313.3	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Draw the transfer function block diagram for single area system provided with dynamic analysis of uncontrolled and controlled case.	C313.2	U, A
	OR		
12.	Explain integral control of single area system for uncontrolled case (i)Static analysis (ii)dynamic analysis	C313.2	U, A
13.	Derive and justify the static and dynamic analysis of Automatic Voltage Regulator loop.	C313.3	R, AZ
	OR		
14.	Explain typical excitation system or Typical brushless Automatic Voltage Regulator and model the same.	C313.3	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss in brief about generation and absorption of reactive power.	C313.3	R, A
	or		
16	Explain the Various methods of voltage control and mention its advantages	C313.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Saranathan College of Engineering

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Internal Assessment Test - II			Date/ Session	15.02.2019/AN	Marks	50
Course code	EE6002	Course Title	POWER SYSTEM TRANSIENTS			
BATCH NO.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	III	Semester/ Section	VI / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What is meant by abnormal switching transients?	C315E13.2	U
2.	Write the expression for voltage across the stray capacitance due to current chopping.	C315E13.2	R
3.	Write the expression for voltage across the capacitor due to capacitance switching.	C315E13.2	R
4.	What is meant by ferroresonance?	C315E13.2	U
5.	Capacitor bank of 5 MVA is connected to a source of 15 kV whose source inductance is 1mH. Calculate the frequency of oscillation of inrush current during the first restrike.	C315E13.2	A
6.	What is the purpose of Ground wires?	C315E13.3	U
7.	What is tower footing resistance?	C315E13.3	U
8.	Classify lightning strokes.	C315E13.3	R
9.	Define dart leader.	C315E13.3	U
10.	Define lightning phenomenon.	C315E13.3	U

Part – B

(Answer all the questions 2 x 10 = 20marks

Q. No.	Questions	CO	Skills
11.	Explain how abnormal transient is generated when no load current is chopped in an unloaded transformer.	C315E13.2	U
	OR		
12.	a. With suitable example explain the concept of ferroresonance.	C315E13.2	U
	b. Explain charge formation in the clouds according to Simpson's and Wilson's theory	C315E13.3	U
13.	a. Define lightning phenomenon. Explain the mechanism of lightning strokes and its characteristics.	C315E13.3	R
	b. State the characteristics of lightning stroke.	C315E13.3	R
	OR		
14.	a. Explain the factors contributing to good line design	C315E13.3	R
	b. Demonstrate how the lightning interacts with the power system.	C315E13.3	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Explain the capacitance switching with multiple restrikes with neat sketches.	C315E13.2	AZ
	OR		
16.	a. Write notes on tower footing resistance.	C315E13.3	R
	b. Discuss the mathematical modeling of lightning discharge in detail.	C315E13.3	A

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Internal Assessment Test - II			Date/ Session	13.02.2019 / FN	Marks	50
Course code	EE6010	Course Title	HIGH VOLTAGE DIRECT CURRENT TRANSMISSION			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/ Section	VIII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Mention the various modes of operation of rectifier characteristics.	C410.2	AZ
2	Write the assumptions for analysis of 6 pulse converter?	C410.2	R
3	Mention the various modes of operation of inverter characteristics.	C410.2	AZ
4	What is meant by snubber circuits?	C410.2	U
5	What is meant by firing angle control?	C410.3	R
6	Why the necessity of control in a DC link?	C410.3	R
7	What is meant by current and extinction control?	C410.3	R
8	Define current margin.	C410.3	U
9	Define start up of DC link.	C410.3	R
10	Draw block diagram of system control hierarchy.	C410.3	R

Part – B
(Answer all the questions 3 x 10 = 30marks)

Q.No.	Questions	CO	Skills
11	Explain the complete characteristics of converter as Rectifier and inverter And also draw the equivalent circuit of HVDC link.	C410.2	AZ
	or		
12	Explain analysis of 12 pulse converter with bridge rectifier.	C410.2	AZ
13	Briefly explain the principle of DC link control.	C410.3	U
	or		
14	Draw and explain the basic V-I characteristics of HVDC converter control.	C410.3	AZ
15	Explain firing angle control and also explain types of firing angle control.	C410.3	U
	or		
16	Explain starting and stopping of DC link.	C410.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

FACULTY NAME: Dr.S.Vijayalakshmi (A-Sec) & N.VIJAYASARATHI (B-SEC)

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/Session	13.02.2019/ AN	Marks	50
Course code	EE6801	Course Title	Electric Energy Generation, Utilization and Conservation			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/Section	VIII / A & B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	List the types of lamps and the types of lighting systems with their applications.	C409.2	R
2	What is the function of a starter and choke coil in a florescent lamp?	C409.2	U
3	Define utilization factor and space height ratio.	C409.2	R
4	Define the term solid angle and plane angle.	C409.2	R
5	Define Illumination and what are the importances of flood lighting?	C409.2	R
6	A 250V lamp has a total flux of 4000 lumens and takes a current of 1A. Calculate (i) efficiency of the lamp. (ii) M.S.C.P per watt.	C409.2	U
7	State the requirements of a good heating material and compare resistance and arc welding.	C409.3	R
8	What is meant by electric arc welding and what are the different types of electrode used in welding and its applicability?	C409.3	U
9	What are the factors which limit the choice of frequency in induction heating and what is salt bath furnace?	C409.3	U
10	List the methods of control of temperature in arc furnaces and some steps taken to minimize pinch effect in induction heating.	C409.3	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

<table>
<tr><th>Q. No.</th><th>Questions</th><th>CO</th><th>Skills</th></tr>
<tr><td>11</td><td>a) State and explain the laws of illumination. (5)
b) Two street lamps are 20m apart and are fitted with 500 C.P. lamp at a height of 8m above the ground each. Find the illumination at a point (i) Directly under each lamps.(ii) Mid way between the lamps. (5)</td><td>C409.2</td><td>A</td></tr>
<tr><td colspan="4">Or</td></tr>
<tr><td>12</td><td>a) A hall 30m long and 12m wide is to be illuminated and illumination required is 50 meter candles. Five types of lamps having lumen outputs, as given below, are available:
<table>
<tr><td>Watts</td><td>100</td><td>200</td><td>300</td><td>500</td><td>1000</td></tr>
<tr><td>Lumens</td><td>1615</td><td>3650</td><td>4700</td><td>9950</td><td>21500</td></tr>
</table>
Taking a depreciation factor of 1.3 and utilization coefficient of 0.5, calculate the number of lamps needed in each case to produce required illumination. Out of above five types of lamps select most suitable type and design a suitable scheme and make a sketch showing location of lamps. Assume a suitable mounting height and calculate space-height ratio of lamps. (6)
b) Explain in detail about polar curves. (4)</td><td>C409.2</td><td>A</td></tr>
</table>

13	a) With neat sketch explain Ajax-Wyatt induction heating furnace. (5) b) Explain the principle and working of dielectric heating. (5)	C409.3	U
	Or		
14	a) Explain the design procedure of heating element. (6) b) Differentiate AC welding and DC welding also explain the thyristorised control circuit of welding. (4)	C409.3	U

PART-C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	a) Explain the various types of lighting scheme available. (4) b) A lamp of 500CP is placed at the center of the room. The room volume is 20x10x5. Calculate the illumination in each corner of the floor and at a point in the middle of the 10m wall at a height 2m from the floor. (6)	C409.2	U
	Or		
16	Explain in detail the design of illumination systems for indoor lighting schemes, factory lighting halls, outdoor lighting schemes, flood lighting. (10)	C409.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In-charge : Dr.C.Krishnakumar & Mr.P.K.Arun Kumar

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	04.04.19/ AN	Marks	50
Course code	BE8253	Course Title	Basic Electrical, Electronics and Instrumentation Engineering			
Batch No.		Duration	90 mins	Academic Year	2018-19	
Year/	I	Semester/ Section	II/ A&B	Department	Mechanical Engineering	

Part – A

(Answer all the questions 10 × 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Draw the torque slip characteristics of three phase Induction motor.	c112.3	U
2	Write the e.m.f. equation of a transformer.	c112.3	R
3	Mention the types of ADC and DAC.	c112.4	R
4	What are the practical characteristics of an op-amp?	c112.4	R
5	List few biasing techniques for transistor.	c112.4	R
6	Differentiate Avalanche and Zener breakdowns.	c112.4	U
7	Mention some applications of transducers.	c112.5	U
8	List the applications of CRO.	c112.5	U
9	Compare moving coil and moving iron instruments.	c112.6	U
10	What are instrument transformers	c112.6	R

Part – B

(Answer all the questions 2 × 10 = 20marks)

Q. No.	Questions	CO	Skills
11a	Explain with a neat diagram, the construction and working of a single-phase transformer.	c112.3	A
	OR		
11b	Explain the construction and working principle of three phase induction motor	c112.3	A
12a	Explain how forward and reverse bias characteristics of a PN junction and Zener diodes can be obtained.	c112.4	A
	OR		
12b	With neat diagram explain any two types of Analog to Digital converters	c112.4	A

Part – C

(Answer all the questions 1 × 10 = 10marks)

Q. No.	Questions	CO	Skills
13a	Explain with neat sketch the operation of attraction and repulsion type moving iron instruments; also derive the expression for deflecting torque.	c112.5	A
	OR		
13b	Explain in detail about construction and operation of Cathode ray oscilloscope.	c112.5	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Members:
Mr.R.Sridhar, AP/EEE, I-Mech-A
Mr.P.Ram Prakash, AP/EEE, I-Mech-B

Saranathan College of Engineering

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Internal Assessment Test - III			Date/ Session	04.04.2019/AN	Marks	50
Course code	BE8254	Course Title	Basic Electrical & Instrumentation Engineering			
Batch No.		Duration	90 mins	Academic Year	2019	
Year/	I	Semester/ Section	II/A&B	Department	ECE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State the necessity of starter and its types.	C112.3	U
2	A 8-pole wave connected armature has 600 conductors and is driven at 625 rev/min. If the flux perpole is 20 mwb, determine the generated emf	C112.3	R
3	Write the principle of operation of three phase induction motor	C112.4	R
4	What is mean by alternator and state its types	C112.4	R
5	In which type of motor can resistance be introduced in the rotor circuit? What is the effect of it?	C112.4	R
6	Compare squirrel cage and slip ring induction motor	C112.4	AZ
7	Distinguish between zero drift and span drift.	C112.5	R
8	What is the need of measurement	C112.5	U
9	Define the terms precision and sensitivity.	C112.5	AZ
10	What is transducer and state its types	C112.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.		Questions	CO	Skills
11a	(i)	Explain the construction and working principle of DC generator(6)	C112.3	E
	(ii)	A 10 pole DC shunt generator with 800 wave connected conductors and running at 600rpm supplies a load of 15Ω resistance at a terminal voltage of 240v. The armature resistance is 0.28Ω and field resistance is 240Ω. Determine the armature current, the induced emf and flux per pole. (4)	C112.3	AZ
OR				
11b	(i)	Explain the construction and working of 3 point starter (5)	C112.3	AZ
	(ii)	With a neat sketch explain about Ward Leonard control system(5)	C112.3	AZ
12a	(i)	Explain in detail the different types of static error (6)	C112.5	E
	(ii)	Discuss the errors in measurements (4)	C112.5	E
OR				
12b	(i)	Explain the construction and principle of working of a LVDT (4)	C112.5	AZ
	(ii)	Draw and explain the operation of MI instruments (6)	C112.5	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.		Questions	CO	Skills
13 a	(i)	Give the constructional details of the rotor of both salient pole and cylindrical rotor synchronous machine(6)	C112.4	**E**
	(ii)	Explain the working principle of capacitor microphone(4)	C112.4	**E**
		OR		
13b	(i)	Derive the torque equation of three phase induction motor(5)	C112.4	**E**
	(ii)	Draw and explain the torque-slip characteristics(5)	C112.4	**E**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

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Internal Assessment Test - III			Date/ Session	04.04.2019/AN	Marks	50
Course code	BE8255	Course Title	Basic Electrical, Electronics and Measurement Engineering			
Batch No.		Duration	90 mins	Academic Year	2019	
Year/	I	Semester/ Section	II/A&B	Department	CSE & IT	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What is the need for earthing?	C110. 4	R
2.	What is the application of solar energy?	C110. 4	R
3.	Define Lumen and Luminous intensity.	C110. 4	R
4.	What are Non-conventional energy sources? With some example.	C110. 4	U
5.	Draw the VI characteristics of Zener diode	C110.5	AZ
6.	What is meant by avalanche breakdown?	C110.5	U
7.	What is the effect of doping?	C110.5	R
8.	What is cut-in voltage and breakdown voltage?	C110.5	R
9.	What is operational amplifier?	C110.5	U
10.	What is an Extrinsic semiconductor?	C110.5	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.		Questions	CO	Skills
11	(i)	Explain in detail about anyone type of solar power plant.	C110.4	U
		OR		
12	(i)	Explain NiCd battery with neat diagram.	C110.4	U
	(ii)	Describe the construction and operation of sodium- vapour lamp.	C110.4	U
13	(i)	Explain the characteristics of CE configuration.	C110.5	U
		OR		
14	(i)	Explain in detail about DAC	C110.5	R

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.		Questions	CO	Skills
15	(i)	Describe the working principle of a PN junction diode with neat diagrams. Also explain its VI characteristics.	C110.5	U
		OR		
16	(i)	Draw and explain Inverting and Non-inverting summing amplifier.	C110.5	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).
Skill need to be mentioned against each question

Faculty Name: CSE – A- N.Karthika, CSE-B –M.Marimuthu, IT – N.Vijayasarathi

Saranathan College of Engineering
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Internal Assessment Test – III			Date/Session	04.04.19/AN	Marks	50
Course code	BE8251	Course Title	BASIC ELECTRICAL AND ELECTRONICS ENG.			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	I	Semester/Section	II/A	Department	CIVIL	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is modulation and demodulation?	112.5	R
2	Differentiate between analog and digital signals.	112.5	R
3	Define modulation index of FM and AM	112.5	U
4	List few applications of microwave communications.	112.5	U
5	What is the concept behind ISDN?	112.5	U
6	What is transponder? What is its use?	112.5	U
7	What are the advantages and disadvantages of fiber optic communication?	112.5	A
8	Convert $(634)_8$ to binary.	112.4	AZ
9	State the merits of FM over AM.	112.5	U
10	Write the decimal equivalent of $(10AB)_{16}$.	112.4	AZ

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Explain the operation of AM and FM in detail.	112.5	A
	Or		
12	Explain with block diagram (i)Radio communication system and (b)Fax	112.5	U
13	With the Help of functional block diagram explain the working of TV transmitter and receiver.	112.5	A
	Or		
14	Describe the satellite communication system with help of block diagram.	112.5	A
15	Draw block diagram of optical fiber communication system and explain the function of each block.	112.4	U
	Or		
16.	Covert **(a.)$(1010101111)_2$= (….)$_8$ = (…….)$_{16}$ (b.) $(725.25)_8$ to its decimal and binary equivalent.**	112.4	AZ

. Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

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Internal Assessment Test - III			Date/ Session	08.03.2018/FN	Marks	50
Course code	EI6402	Course Title	Electrical Machines			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/ Section	IV	Department	ICE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is meant by slip of an induction motor? Under what circumstances the slip is unity?	C212.5	R
2	Why an induction motor will never run at its synchronous speed?	C212.5	AZ
3	Rotor resistance starting is preferred to reduce voltage starting of a wound rotor induction motor. Why?	C212.5	AZ
4	How the three phase induction motors are classified?	C212.5	R
5	Draw the slip torque characteristics of three phase induction motor.	C212.5	R
6	List the methods available to control the speed of an induction motor.	C212.5	A
7	State double field revolving theory.	C212.6	R
8	Why centrifugal switches are provided in single phase induction motors?	C212.6	U
9	Classify the types of single Phase induction motor.	C212.6	AZ
10	Write the applications of single phase induction motors.	C212.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain the working of autotransformer starter of a 3 phase induction motor with a neat diagram.	C212.5	U
11 b	Explain the star-delta method of starting of 3ϕ induction motor.	C212.5	E
	Or		
12	Discuss in detail, the various methods used for controlling the speed of three phase squirrel cage induction motor.	C212.5	U
13	Explain why single phase induction motors are not self- starting by using double filed revolving theory.	C212.6	U
	Or		
14 a	Describe the working principle of shaded pole induction motor	C212.6	U
14 b	With neat diagram, explain the working principle of capacitor start and capacitor run induction motor.	C212.6	U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Describe the construction and working principle of three phase induction motor with emf and torque equation	C212.5	U
	Or		
16	The power input to a 400 volts, 60 Hz, 6-pole, 3- phase induction motor running at 1140 rpm is 40 KW at 0.8 pf lag. Stator losses are 1 KW and the friction and windage losses are 2 KW. Find the following: (1) Slip (2) Rotor copper loss (3) The brake h.p. (4) Efficiency and (5) Input current	C212.5	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Saranathan College of Engineering

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Internal Assessment Test - III			Date/ Session	07.03.2019 /FN	Marks	50
Course code	EE8401	Course Title	Electrical Machines-II			
Batch No.		Duration	90 mins	Academic Year	2018 – 2019	
Year/	II	Semester/ Section	IV/A&/B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is cogging?	C210.3	U
2	What is the effect of change in supply voltage on starting torque of induction motor?	C210.3	R&U
3	Name the various types of starter commonly used for starting an induction motor.	C210.4	AZ
4	What are the different types of protection provided in starter used for three phase induction motor?	C210.4	U
5	Is it possible to include/exclude external resistance in the rotor of a squirrel cage induction motor? Justify.	C210.4	U
6	Explain the effect of rotor resistance starter allows fast start with heating of induction motor.	C210.4	R
7	Why most of the three phase induction motor constructed with delta connected stator winding?	C210.4	U
8	Write the speed equation of an induction motor.	C210.4	U
9	Why single phase induction motor is not self starting?	C210.5	U
10	Name the motors used in ceiling fan and in lathes.	C210.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	An 8-pole, 50 Hz, three phase slip ring induction motor has effective rotor resistance of 0.08Ω/phase. The speed correspond to maximum torque is 650 rpm. What is the value of resistance to be inserted in rotor circuit to obtain maximum torque at starting?	C210.3	AZ
11 b	The power input to the rotor of a three phase, 50Hz, 6 pole induction motor is 75 kW. The rotor emf makes 100 complete alterations per minute. Find (i) slip (ii) motor speed (iii) mechanical power developed (iv) rotor copper loss per phase.	C210.3	U, AZ, A, E
	Or		
12a	Explain the step by step procedure to construct circle diagram for three phase induction motor.	C210.3	U, AZ, A, E
12b	Write short note on (i) induction generator and (ii) crawling.	C210.3	U, AZ, A, E
13	Use double field revolving theory, explain why single phase induction motor is not self starting. Also write short note on stator and rotor construction.	C210.5	U, AZ, A, E
	Or		
14	Explain with suitable diagram, the working principle of split phase and capacitor start induction motor,	C210.5	R&U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.a.	Explain the speed control of three phase wound rotor induction motor by rotor resistance method.	C210.4	U
15.b.	With neat diagrams, explain the working of any two types of starters used for squirrel cage type three phase induction motor.	C210.4	U
	or		
16	A small squirrel cage induction motor has a starting current of six times the full load current and a full load slip of 0.05. Find in P.U of full load values the line current and starting torque with the following methods of starting [(a) to (d)]. (a) Direct switching (b) stator resistance starting with motor current limited to 2 P.U. (c) auto-transformer starting with motor current limited to 2 P.U and (d) Y-delta starting (e) what auto-transformer ratio would give 1 P.U starting torque?	C210.4	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Prepared by Dr.S.Thamizharasan & Mr.P.Rameshbabu

Saranathan College of Engineering

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Internal Assessment Test – III			Date/ Session	08.03.19/ FN	Marks	50
Course code	EE8403	**Course Title**	**Measurements and Instrumentation**			
Batch No.		**Duration**	90 mins	**Academic Year**	2018-2019	
Year	II	**Semester/ Section**	IV / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the advantages and disadvantages of Maxwell Bridge?	C212.3	R
2	What is Transformer ratio bridge?	C212.3	R
3	List the sources of Electromagnetic Interference.	C212.3	R
4	Define ground loop. How it is created?	C212.3	U&AZ
5	Write about the necessity of Grounding and main causes of ground loop currents.	C212.3	AZ
6	What are the basic requirements of a transducer?	C212.5	R
7	List the applications of a capacitive transducer.	C212.5	R
8	Define Gauge factor.	C212.5	U
9	Mention some advantages of Fibre optic sensor..	C212.5	U
10	What are the requirements for the resistance materials used in RTDS?	C212.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	With the help of Schering Bridge, explain how loss angle of a dielectric can be determined.	C212.3	U
	OR		
12	Explain the different types of Electromagnetic Interferences and their Screening methods to reduce them.	C212.3	U
13	Describe the different criteria for selection of Transducers for a particular application.	C212.5	A
	OR		
14	Explain the principle of Piezoelectric transducers and name any two piezoelectric materials.	C212.5	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	With a functional Block diagram, explain the concept of Data acquisition system?	C212.5	A
	OR		
16	Explain Successive approximation type ADC with its characteristics.	C212.5	U & A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

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Internal Assessment Test – III			Date/Session	09-03-19 / FN	Marks	50
Course code	IC8451	Course Title	CONTROL SYSTEMS			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	II	Semester/Section	04 / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define the terms (i) Phase margin (ii) Gain margin	C214.4	R
2	Why is frequency response analysis important in control applications?	C214.4	R
3	What is the slope of a zero at origin in Gain plot?	C214.4	R
4	Find the corner frequency of G(s)=10 / s(1+0.5s)	C214.4	U
5	What is polar plot?	C214.4	R
6	What is the phase of a constant (–k) in sinusoidal transfer function G(jw)?	C214.4	U
7	What is the necessary condition for stability?	C214.5	U
8	What is routh stability criterion?	C214.5	R
9	Define BIBO stability	C214.5	R
10	What is your conclusion when there aretwo sign change in the elements of first column in routh array?	C214.5	U

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Sketch the Bode plot and hence find Gain cross over frequency, Phase cross over frequency, Gain margin and Phase margin for the function G(S)=10/S(1+0.4S)(1+0.1S)	C214.4	E
	(OR)		
12	Develop the Bode plot for the open loop transfer function of a unity feedback system G(s)=10/s(s+2)(s+6) and Determine: (i) Gain Margin (ii) Phase Margin (iii) Gain Cross Over Frequency (iv) Phase Cross Over Frequency.	C214.4	E
13	Sketch the polar plot for the following transfer function and find Gain cross over frequency, Phase cross over frequency, Gain margin and Phase margin for G(s)=400/s(s+2)(s+10).	C214.4	E
	(OR)		
14	Draw the Polar plot for the Open Loop Transfer Function $G(s)=1/S(1+S)^2$. Determine and Calculate the (i) Gain Margin (ii) Phase Margin (iii) Gain Cross Over Frequency (iv) Phase Cross Over Frequency.	C214.4	E
	PART – C **(Answer all the questions 1 x 10 = 10marks)**		
15	(i) Use R-H criterion to determine the location of the roots and stability for the system represented by characteristic equation **(i)** $s^5+4s^4+8s^3+8s^2+7s+4=0$ **(ii)** $s^7+9s^6+24s^5+24s^4+24s^3+24s^2+23s+15=0$	C214.5	E
	(OR)		
16	Determine the range of K for stability of unity feedback system whose open loop transfer function is G(s)=K/s(s+1)(s+2)	C214.5	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty name: R.Balasubramanian & S.Sivakumar

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	07.03.2019/FN	Marks	50
Course code	EE8402	Course Title	Transmission and Distribution			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	II	Semester/ Sec	IV/A&B	Department	EEE	

Part – A (Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define sag	C212.2	R
2	Define safety factor in mechanical design of transmission line.	C212.2	R
3	What is the effect of wind and ice loading on sag?	C212.2	U
4	What is meant by stringing chart?	C212.2	R
5	List the types of substations classified according to its construction	C212.5	U
6	What are the different methods of neutral grounding?	C212.5	U
7	Mention the different types of HVDC links	C212.5	R
8	What are the different types of FACTS devices?	C212.5	R
9	What are the advantages of EHVAC system?	C212.5	R
10	List the different types of losses in a cable.	C212.4	R

Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Deduce an approximate expression for sag in overhead lines when supports are at equal levels.	C212.2	U
	or		
12	An overhead line at the river crossing is supported from two towers of heights 30 m and 90 m above water level with the span of 300 m. The weight of the conductor is 1 kg/m and working tension is 2000 kg. Determine the clearance between the conductor and the water level midway between the towers.	C212.2	AZ
13	Find the maximum working voltage of a single core cable having 2 insulating materials A & B and the radius of outer conductor be 0.5cm. The outermost sheath radius is 2.5cm. maximum working potential gradient of A&B are 60 kV/cm and 50 kV/cm respectively and relative permittivities 4 and 2.5 respectively.	C212.5	AZ
	or		
14	Explain any three busbar system with neat sketch employed in a substations.	C212.5	AZ

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the Following: 1] Neutral Grounding 2] Resistance grounding	C212.6	R
	or		
16	Explain with neat sketch the different types of HVDC links and mention the advantages and disadvantages.	C212.6	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III Set-1			Date/Session	08 .03.19/AN	Marks	50
Course code	EE6602	Course Title	EMBEDDED SYSTEM			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	III	Semester/Section	VI/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is ICE? What for it is used?	312.6	R
2	What is deployment?	312.6	R
3	Define the operation of timer cum counter	312.6	AZ
4	What are the objectives of EDLC?	312.6	R
5	What is state machine model?	312.6	R
6	Define context switching.	312.4	R
7	Define semaphore.	312.4	U
8	Define process and threads in RTOS.	312.4	R
9	What is preemptive and non preemptive scheduling?	312.4	R
10	Define RTOS with example.	312.4	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	What are the interrupt handling mechanisms involved in RTOS for responding to the hardware source call from interrupts.	312.4	U
	or		
12	Write about task scheduling and its types with its advantage and disadvantages	312.4	U
13	Explain briefly about process ,threads and task	312.4	U
	or		
14	Explain the types of IPC with its functions and examples.	312.4	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions		Skills
15	Explain the case study of smart card with its neat architecture.	312.6	A
	or		
16.	Discuss about the various computational models in embedded design.	312.6	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: R.Vijay, AP/EEE & M.Marimuthu, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	07-03-2019/ FN	Marks	50
Course code	EE6601	Course Title	Solid State Drives			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	III rd	Semester/ Section	VI / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skils
1	List the various speed control methods of Induction Motor.	C311.4	U
2	What are the drawbacks of stator voltage control?	C311.4	U
3	Define slip.	C311.4	U
4	Draw and mention the regions in the Speed-Torque characteristics of IM.	C311.4	A
5	Define base speed.	C311.4	U
6	Frequency control is not normally used .Why?	C311.4	AZ
7	What is boost voltage in v/f control?	C311.4	U
8	List the applications of IM drives.	C311.4	U
9	What happens if the control loop is without current loop?	C311.6	R
10	What is a speed feedback?	C311.6	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	CO	Skills
11	Explain the theory of (volts/Hz) control of Induction motor drive with its performance characteristics and its applications.	C311.4	U
	or		
12	Explain the closed loop control of VSI fed Induction motor drives.	C311.4	R
13	Explain the stator voltage control of Induction Motor drive with its advantages and disadvantages.	C311.4	R
	or		
14	A 2.8KW, 400V, 50HZ,4 -pole ,1370rpm, delta connected squirrel-cage IM has the following parameters referred to the stator: Rs=2Ω, Rr'=5 Ω, Xs=Xr' =5 Ω, Xm=80 Ω. Motor speed is controlled by stator voltage control. When driving a fan load it runs at rated voltage. Calculate motor terminal voltage, current and torque at 1200 rpm.	C311.4	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	CO	Skills
15	Derive the transfer function of the speed controller with a neat block diagram.	C311.6	A
	or		
16	Obtain the transfer function of the current controller with a neat block diagram	C311.6	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge: C.Pearline Kamalini /AP/EEE/SCE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	09.03.2019 /AN	Marks	50
Course code	EE6604	**Course Title**	Design of Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2018 – 2019	
Year/	III	**Semester/ Section**	VI/ A&B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write the expression for output equation and output coefficient of induction motor.	C314.5	R
2	What are the factors to be considered for the choice of specific electric loading?	C314.5	R
3	How the induction motor can be designed for best power factor?	C314.5	R
4	What are the factors to be considered for selecting the number of slots in induction machine stator?	C314.5	AZ
5	What are factors to be considered for estimating the length of air gap in an Induction motor?	C314.5	AZ
6	Distinguish between cylindrical pole and salient pole construction.	C314.6	U
7	What is run-away speed?	C314.6	R
8	Mention the uses of damper winding in a synchronous machine.	C314.6	R
9	Salient pole alternators are not suitable for high speeds. Why?	C314.6	U
10	List the factors to be considered for separation of D and L for cylindrical rotor machines.	C314.6	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Derive the output equation of AC machine in terms of its main dimensions.	C314.5	AZ
11 b	Find the main dimensions of a 15 kW, 3Ø, 400V, 50 Hz, 2810 rpm squirrel cage induction motor having an efficiency of 0.88 and a full load power factor of 0.9. Assume specific magnetic loading= 0.5wb/m^2, specific electric loading= 25000A/m. Take the rotor peripheral speed as approximately 20m/s at synchronous speed.	C314.5	U, AZ, A, E
	Or		
12	Determine the main dimensions, number of radial ventilating ducts, number of slots and the number of turns per phase of a 3.7 kW, 400V, 3Ø, 4 pole, 50 Hz squirrel cage induction motor to be started by a star-delta starter. Work out the winding details.. Assume average flux density in the gap= 0.45wb/m^2, ampere conductors per meter= 23000, efficiency= 0.85, power factor= 0.84, winding factor= 0.955 and stacking factor= 0.9. Machine rated at 3.7 kW, 4 poles are sold at a competitive price and therefore choose the main dimensions to give a cheap design.	C314.5	U, AZ, A, E
13	A 1000kVA, 3300V, 50Hz, 300 rpm, 3Ø alternator has 180 slots with 5 conductors per slot. Single layer winding with full pitch coils is used. The winding is star connected with one circuit per phase. Determine the specific electric and magnetic loadings if the stator bore is 2 m and the core length is 0.4 m. using the same loadings, determine the corresponding data for a 1250 kVA, 3300V, 50 Hz, 250 rpm, 3Ø star connected alternator having 2 circuits per phase. The machines have 60° phase spread.	C314.6	U, AZ, A, E
	Or		
14 a	Find the main dimensions of a 2500 kVA, 187.5 rpm, 50 Hz, 3Ø, 3 kV, salient pole synchronous generator. The generator is to be a vertical water wheel type. The specific magnetic loading is 0.6 wb/m^2, and the specific electric loading is 34000 A/m. Use circular poles with ratio of core length to pole pitch= 0.65. Specify the type of pole construction used if the run-away speed is about 2 times the normal speed.	C314.6	AZ, E

14 b	Determine the main dimensions for a 1000KVA, 50 Hz, 3Ø, 375 rpm alternator. The average air gap flux density is 0.55 wb/m^2 and the ampere conductors per meter are 28,000. Use rectangular poles and assume a suitable value for ratio of core length to pole pitch in order that bolted on pole construction is used for which the maximum permissible peripheral speed is 50 m/s. The runaway speed is 1.8 times the synchronous speed.	C314.6	U, AZ, A, E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Design a cage rotor for a 40 HP, 3Ø, 400V, 50Hz, 6 pole, delta connected induction motor having a full load efficiency of 87% and a full load power factor= 0.85, take D= 33cm and L= 17 cm. stator slots= 54 and conductor per slot= 14. Assume suitable missing data if any.	C314.5	E
	Or		
16	A 90 kW, 500V, 50 Hz, 3Ø, 8 pole induction motor has a star connected stator winding accommodated in 63 slots with 6 conductors per slot. If the slip ring voltage on open circuit is to be about 400V, find a suitable rotor winding, stating: (a) number of slots (b) number of conductor per slot (c) coil span (d) slip ring voltage on open circuit (e) approximate full load current per phase in rotor. Assume efficiency= 0.9, power factor= 0.86	C314.5	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Prepared by Dr.S.Thamizharasan, Mr.P.K.Arunkumar

Saranathan College of Engineering

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Panjappur, Tiruchirappalli - 620012

Internal Assessment Test – III			Date / Session	**08.03.2019/FN**	Marks	**50**
Course code	**EE6603**	Course Title	**POWER SYSTEM OPERATION AND CONTROL**			
Batch No		Duration	**90 minutes**	Academic Year		**2018 – 2019**
Year	**III**	Semester / Section	**VI / A & B**	Department		**EEE**

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define Crew Constraints.	C313.4	R
2.	Define incremental cost in power dispatch.	C313.4	U
3.	Define priority list problem.	C313.4	U
4.	Define incremental cost.	C313.4	R
5.	Write the condition for the optimal dispatch in a lossless system	C313.4	A
6.	Distinguish between economic dispatch and unit commitment	C313.4	AZ
7.	What is meant by FLAPC ?	C313.4	R
8.	Define state estimation?	C313.5	R
9.	What are the functions of SCADA?	C313.5	R
10.	Mention the different operating states in a power system	C313.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Explain with a neat flow chart the λ- iteration method for solving the economic dispatch without loss.	C313.4	AZ
	OR		
12.	A generating unit has two units whose input cost data is a follows: **F1= 0.02P1^2+40P1+120 Rs/hr** **F2= 0.25P1^2+30P1+150 Rs/hr** For a total load of **180 MW**, find the optimal load dispatch and operating cost for the two units. The maximum and minimum loading limits are **100MW and 25MW**.	C313.4	AZ, A
13.	Create a unit commitment using the priority list method for the load of **800MW**, The fuel cost eqns are as follows: **Unit 1: F1(P1)=561+7.92P1+0.001562P1^2 150≤P1≤600** **Unit 2: F2(P2)=310+7.85P2+0.00194P2^2 100≤P2≤400** **Unit 3:F3(P3)=93.6+9.56P3+0.005784P3^2 50≤P3≤200**	C313.4	AZ, A
	OR		
14.	Explain forward dynamic programming approach for solving Unit commitment problem with neat flow chart.	C313.4	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Discuss with neat state transition diagram outlining the various operating state transitions and control strategies in power system.	C313.5	U,A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	09.03.2018/FN	Marks	50
Course code	EE6002	Course Title	POWER SYSTEM TRANSIENTS			
BATCH NO.		Duration	90 mins	Academic Year	2018 - 2019	
Year/	III	Semester/ Section	VI / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What are the damages caused by the travelling wave?	C315.5	R
2.	Define crest and front of a travelling wave.	C315.5	U
3.	What is the importance of Bewely's lattice diagram?	C315.5	U
4.	Mention the specifications of travelling wave?	C315.5	U
5.	Define standing wave ratio.	C315.5	R
6.	Define propagation constant.	C315.5	U
7.	Distinguish the line dropping and load rejection.	C315.6	U
8.	Mention any four causes of switching surges.	C315.6	AZ
9.	Define switching overvoltage factor.	C315.6	R
10.	Write an expression for amplitude of the over voltage with circuit diagram during load rejection.	C315.6	AZ

Part – B

(Answer all the questions 2 x 10 = 20marks

Q. No.	Questions	CO	Skills
11.	Discuss transient response of systems with series and shunt lumped parameters and distributed lines.	C315.5	AZ
	OR		
12.	Derive the step response of travelling waves on transmission lines.	C315.5	AZ
13.	a. Explore the steps involved in Bewely's lattice diagram construction with an example.	C315.5	R
	b. Derive the reflection and refraction coefficients of a travelling wave with diagrams.	C315.5	AZ
	OR		
14.	Explain the behavior of travelling waves at line termination for a) Open circuited line b) Short circuited line	C315.5	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Discuss in detail about the kilometric fault with necessary diagrams, expressions and voltage and recovery voltage waveforms.	C315.6	U
	OR		
16.	With suitable illustration discuss computation mechanism and algorithms for analyzing the transients in integrated power systems.	C315.6	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Prepared by, Dr.K.Rajkumar & Mr.B.Paranthagan

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/ Session	07.03.2019 / AN	Marks	50
Course code	EE6010	Course Title	HIGH VOLTAGE DIRECT CURRENT TRANSMISSION			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/ Section	VIII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Distinguish between characteristic and non-characteristic harmonics.	C410.4	U
2	How the effectiveness of the dc filter is judged in HVDC system?	C410.4	AZ
3	What are the demerits of synchronous condensers?	C410.4	R
4	What are the advantages of thyristor switched capacitor instead of fixed capacitor	C410.4	R
5	What is the significance of power flow analysis in AC/DC systems?	C410.5	U
6	Write the per unit voltage equation for a HVDC converter	C410.5	R
7	What are the four basic variables in a converter used for DC load flow solution?	C410.5	R
8	Give the procedure for DC load flow solution	C410.6	AZ
9	What are the assumptions made in DC load flow?	C410.6	U
10	Draw a diagram for 5 terminal MTDC systems	C410.6	R

Part – B
(Answer all the questions 3 x 10 = 30marks)

Q.No.	Questions	CO	Skills
11	Explain AC and DC side harmonics in detail and discuss how to reduce the harmonics.	C410.4	AZ
	or		
12	Explain in detailed about requirement of reactive power in HVDC converter under steady state and how they are affected by the converter control methods.	C410.4	R
13	Explain detail about the analysis of single tuned AC filters and write the design criteria for AC filters.	C410.5	AZ
	or		
14	Explain detail about the analysis of double tuned AC filters and write the design criteria for AC filters.	C410.5	AZ
15	With a neat flow chart explain the solution of AC-DC power flow.	C410.6	AZ
	or		
16	Derive the mathematical modeling of HVDC links for power flow analysis.	C410.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name: Dr.S.Vijayalakshmi (A-Sec) & N.Vijayasarathi (B-Sec)

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III			Date/Session	07.03.2019/ FN	Marks	50
Course code	EE6801	Course Title	Electric Energy Generation, Utilization and Conservation			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/Section	VIII / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define solar constant and solar time.	C409.4	R
2	Define collector efficiency and list the advantages of solar concentrators.	C409.4	R
3	Write down the energy balance equation for solar collectors.	C409.4	R
4	List the different types of solar collectors.	C409.4	R
5	What are the advantages and disadvantages of concentrating collectors over a flat plate collector?	C409.4	U
6	List the basic components of WECS and mention their classification.	C409.5	R
7	List the factors responsible for distribution of wind energy on the surface of earth and what are the causes of aerodynamic force?	C409.5	R
8	Write down the condition for maximum power generation in wind conversion system and list the types of wind turbine.	C409.5	R
9	What is cut in speed and cutout wind speeds for turbine?	C409.6	U
10	Define Tip Speed Ratio and what are the environmental impacts of wind energy systems?	C409.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	a) What are the main components of a flat plate solar collector, explain the function of each. (5) b) Discuss in detail about the performance of cylindrical and parabolic concentrating collector. (5)	C409.4	U
	Or		
12	a) Explain the solar radiation geometry at earth surface. (5) b) Explain the basic phenomenon of solar energy conversion with suitable diagram. (5)	C409.4	U
13	Explain the various schemes of power generation based on speed & frequency. (10)	C409.5	U
	Or		
14	Discuss the analysis of aerodynamic forces acting on the wind blade. (10)	C409.5	U

PART-C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the construction and operation of VAWT with its advantages and disadvantages. (10)	C409.6	U
	Or		
16	Describe the functions of various blocks of a WECS with the help of block diagram and explain the important factors that are considered for site selection of WECS. (10)	C409.6	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In-charge : Dr.C.Krishnakumar & Mr.P.K.Arun Kumar

2019-2020 - ODD SEMESTER

INTERNAL ASSESSMENT QUESTION

PAPERS

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/Session	19.07.19/FN	Marks	50
Course code	EE8353	Course Title	ELECTRICAL DRIVES AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	II	Semester/Section	III/A&B	Department	MECH	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define electrical drives. What are the advantages of Electrical drives?	205.1	U
2	Define the heating and cooling time constants.	205.1	U
3	Mention the power rating formulae for motors with linear load.	205.1	U
4	What are the basic elements of electrical drive?	205.1	E
5	What type of drive to be selected for a paper mill?	205.1	U
6	Give the applications of shunt and series motors.	205.2	R
7	Define back emf.	205.2	R
8	A motor has a thermal heating time constant of 45 minutes. When the motor runs continuously on full load its final temperature rises to 80 degree Celsius. What would be the temperature rise after 1 hour, if the motor runs continuously on full load?	205.2	AZ
9	Derive the general torque equation of DC motor?	205.2	E
10	Why DC series motor never started on no load?	205.2	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(i)Explain the different classes of duty with examples? (7) (ii).What are types of electrical drive? Explain with example(3)	205.1	A
	or		
12	Derive the expression for cooling of a motor from heating curve with necessary assumptions.(10)	205.1	U
13	The temperature rise of a motor when operating for 30 min. on full load is 35 degree Celsius and becomes 15 degree Celsius when the motor operates for another 30 minutes on the same load. Determine the heating time constant and steady state temperature rise.	205.1	A
	or		
14	Explain the selection of motor power rating for various loading conditions.(All 3 cases) (10)	205.1	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A 500V DC shunt motor with constant field drives a load whose torque is proportional to the square of the speed. When running at 900 rpm it takes an armature current of 45A Find the speed at which the motor runs if a resistance of 8Ω is connected in series with armature ,R_a =1Ω	205.2	AZ
	or		
16	(i).A 460V series motor runs at 500 rpm taking a current of 40A, calculate the speed and percentage change in torque if the load is reduced so that the motor is taking 30A, total resistance of the armature and field circuit is 0.8Ω.Assume flux is proportional to the field current.(6) (ii) From the electrical characteristics of DC series motor derive the mechanical characteristics(4)	205.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: MrR.Vijay, AP/EEE & Mr.S.Sivakumar AP/EEE.

Saranathan College of Engineering
Tiruchirapall

Internal Assessment Test - I			Date/ Session	17.07.19	Marks	50
Course code	EE8501	Course Title	Power System Analysis			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year/	III	Semester/ Section	V / A&B	Department	EEE	

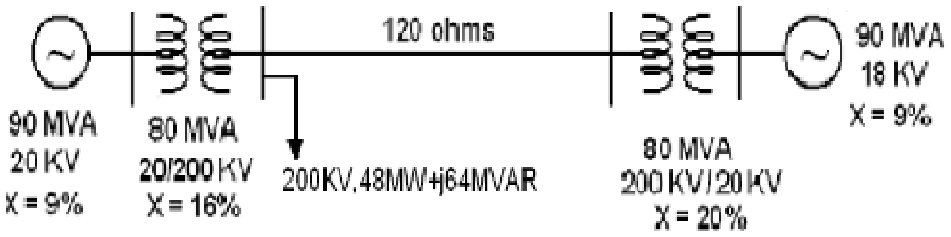
Part – A

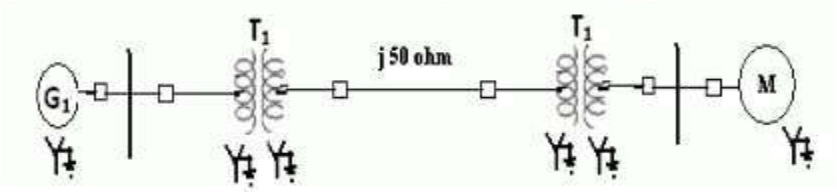
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	A Y-connected generator rated at 300MVA, 33kV, has a reactance of 1.24	C301.1	A
2	Mention the advantages of per unit system.	C301.1	U
3	What is the need of base value?	C301.1	U
4	Mention the approximations made in the reactance diagram.	C301.1	U
5	What is single line diagram?	C301.1	A
6	What is off nominal transformer ratio? Draw the equivalent circuit of the transformer	C301.1	A
7	Classify the types of buses based on the specified quantities and the quantities to be obtained from the load flow equations.	C301.2	R
8	What is the need of slack bus?	C301.2	U
9	Write the expression for the injected power to a bus.	C301.2	R
10	Mention the merits and demerits of Gauss-Seidel load flow solution.	C301.2	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Draw the p.u impedance diagram for the system shown in figure. Choose Base MVA as 100 MVA and Base KV as 20KV. 	C301.1	A&Z
	OR		
12	Examine the reactance diagram for the power system shown in fig. Neglect resistance and use a base of 100MVA , 220kV in 50KΩ line. The ratings of the generator motor and transformer are give below. Generator: 40MVA, 25KV, X'' =20%. Synchronous Motor: 50MVA, 11KV, X''=30% T1: Y-Y transformer : 40MVA 33/220KV, X=15% T2: Y-Y transformer : 30 MVA 11/220KV, X=15%	C301.1	A&Z

			
13	**For the power system network with the following data, compute the bus admittance matrix using inspection method. Also find the new admittance matrix by eliminating the bus 4.** **Bus Code | p.u line impedance | Half Line Charging admittance in p.u.** **1-2 | 0.05+j0.12 | j0.025** **2-3 | 0.06+j0.4 | -** **3-4 | 0.75+j0.25 | j0.02** **1-3 | 0.045+j0.45 | j0.015** **1-4 | 0.015+j0.05 | -**	**C301.1**	**A&Z**
	OR		
14	**Form Y_{BUS} using singular transformation method for the following data. Take node 1 as reference node.** **Bus Code | Bus-Code | Self Impedance in p.u** **1 | 1-2(1) | 0.6** **2 | 1-3 | 0.5** **3 | 3-4 | 0.5** **4 | 1-2(2) | 0.4** **5 | 2-4 | 0.2**	**C301.1**	**A&Z**

Part – C

(Answer all the questions 1 x 10 = 10marks)

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Q. No.	Questions	CO	Skills
15	**Explain the types of buses and derive the power flow equations in load flow analysis.**	**C301.2**	**U&R**
	OR		
16	**Draw the flowchart and explain the computational procedure for load flow solution using Gauss-Seidal method.**	**C301.2**	**U&R**

Faculty Members:

Dr. M.V.Suganyadevi, ASP/EEE; Mr.R.Sridhar, AP/EEE

Saranathan College of Engineering

Tiruchirapalli-

Internal Assessment Test – I SET 2			Date/ Session	22-07-19 / FN	Marks	50
Course code	EE8551	Course Title	Microprocessor and Microcontrollers			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year/	III	Semester/ Section	V / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Define machine cycle.	C302.1	U
2	What are the interrupts available in 8085 processor.	C302.1	R
3	Give the difference between maskable and non-maskable interrupts.	C302.1	U
4	Mention the applications of 8085 microprocessor.	C302.1	U
5	What is the use of temporary registers.	C302.1	A
6	Mention the addressing modes available in 8085 processor.	C302.2	A
7	List the classification of instructions based on its size.	C302.2	R
8	How many address and data lines are in 8085.	C302.1	A
9	Give examples for one byte, two byte and three byte instructions?	C302.2	A
10	What is the significance of reset in and reset out pins.	C302.1	A

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Explain briefly about the hardware interrupts available in 8085 microprocessor.	C302.1	R
	OR		
12	Explain with a neat block diagram, the architecture of 8085 microprocessor.	C302.1	R
13	Write and explain briefly about any five instructions of 8085 processor.	C302.2	AZ
	OR		
14	Explain the addressing modes of 8085 microprocessor with example for each.	C302.2	R

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	Draw and explain the timing diagram for opcode fetch and memory write.	C302.1	AZ
	OR		
16	Interface 2kB EPROM with starting address from 0000H and 4kB Ram with starting address followed by EPROM	C302.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Incharge: M. MARIMUTHU & S.Ram Prasath,AP,EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	18.7.2019 / FN	Marks	50
Course code	EE8552	Course Title	Power Electronics			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year/	III	Semester/ Section	V / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Compare the merits and demerits of IGBT and MOSFET	C205.1	R
2	What is meant by commutation of SCR and list its types.	C205.1	R
3	Mention the merits and demerits of GTO.	C205.1	R
4	Define the term holding current and latching current.	C205.1	U
5	Why are IGBT becoming popular in PE based applications?	C205.1	U
6	Draw TRIAC I-V characteristics.	C205.1	U
7	Enhancement type MOSFETs are normally _____devices while depletion type MOSFETs are normally _____ devices.	C205.1	A
8	Illustrate the need of snubber circuit.	C205.1	A
9	What is meant by phase control?	C205.2	R
10	A two pulse converter is fed with a 230V, 50 Hz supply. The load on the converter is a pure resistance of R=10 Ω. Obtain the average output voltage for a firing angle of α =35°	C205.2	E

Part – B

(Answer all the questions 2 x 10 = 20 marks) Maximum 2 splits/Question

Q. No.	Questions	CO	Skills
11	Describe with circuit IGBT static I-V, transfer and turn –on and turn–off characteristics.	C205.1	R
	OR		
12	Explain the steady state and switching characteristics of MOSFET with aid of diagrams.	C205.1	R
13	Explain and draw steady state and switching characteristics of SCR.	C205.1	R
	OR		
14	Explain the working of any three forced commutation technique	C205.1	R

Part – C

(Answer all the questions 1 x 10 = 10 marks) Case study or Analytical type

Q. No.	Questions	CO	Skills
15	Explain the operation of a single phase full converter with RLE load using relevant waveforms. obtain the expressions for its average output voltage and RMS value of output voltage .	C205.2	**A**
	OR		
16	Explain the operation of a single phase full converter with RL load using relevant waveforms. obtain the expressions for its average output voltage and RMS value of output voltage .	C205.2	**A**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Subject handling Faculty : R.Balasubramanian / Assoc Prof / EEE & S.Sivakumar / AP / EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/ Session	19.07.2019/ FN	Marks	50
Course code	EE8591	Course Title	Digital Signal Processing			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	III	Semester/ Section	V/A & B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define Spectral Density.	C304.1	R
2	What is Nyquist Rate?	C304.1	U
3	What is meant by aliasing effect?	C304.1	U
4	Find whether the given system is causal or not, x(n)=x(n+1)+x(n-2)	C304.1	A
5	Determine x(n)=u(n) is an energy signal or power signal.	C304.1	A
6	List the sampling techniques.	C304.1	R
7	What is an anti-aliasing filter?	C304.1	R
8	Determine the Z-Transform and ROC of the finite duration signals (i) x(n)={3,2,2,3,5,0,1} (ii) x(n)=δ(n-k)	C304.2	A
9	Write the properties of Region of Convergence.	C304.2	R
10	List the methods to find inverse Z-Transform.	C304.2	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Illustrate the condition of the system to be causal, linear and time invariant. Check the same for the given system, $y(n) = x(n) + \frac{1}{x(n-1)}$	C304.1	AZ
	or		
12	Explain the classification of discrete time signals with its mathematical representation.	C304.1	R
13	Find the Z-Transform and ROC of $x(n) = r^n \cos(n\theta)\, u(n)$	C304.2	AZ
	or		
14	State and prove Convolution and Parseval's Theorem using Z-Transform	C304.2	A
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	State and prove Sampling theorem.	C304.1	A
	or		
16	Determine whether the given signal is energy or power or neither energy nor power signals. $x_1(n) = \left(\frac{1}{2}\right)^n u(n)$ $x_2(n) = \sin\left(\frac{\pi}{6}n\right)$ (5+5)	C304.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.P.Ram Prakash, AP/EEE, Ms.A.R.Danila Shirly, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	22.07.2019/FN	Marks	50
Course code	EC8353	Course Title	Electron Devices And Circuits			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	II	Semester/ Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is barrier potential?	C205.1	U
2	What is reverse saturation current in PN junction diode?	C205.1	AZ
3	What are the applications of a Laser diode?	C205.1	R
4	What is transition capacitance and diffusion capacitance?	C205.1	R
5	A Zener shunt regulator having series and load resistances of 2.2kΩ and 1kΩ with minimum and maximum values of current through Zener diode are 2.5mA and 25mA respectively. The voltage across Zener diode is 6.1V. Find the minimum and maximum values of input voltage.	C205.1	E
6	Find the values of series resistance required when two 10W-10V-1A Zener diodes are connected in series to obtain 20 V regulated dc power supply from a 30V unregulated dc source.	C205.1	R
7	When a reverse bias is applied to a germanium PN junction diode, the reverse saturation current at room temperature is 0.3uA. Determine the current flowing through the diode, when 0.15V forward bias is applied at room temperature.	C205.1	E
8	Calculate the potential at the junction of a silicon PN diode, at 300K with doping densities $N_A = 1\times10^{18}cm^{-3}$, $N_D = 1\times10^{15}cm^{-3}$, Assume $n_i = 1.5\times10^{10}cm^{-3}$	C205.1	U
9	Why two back to back diodes configuration cannot be used as transistor?	C205.2	U
10	What is meant by biasing?	C205.2	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Draw and explain the characteristics of PN junction diode.	C205.1	U
11 b	What is diffusion capacitance? Derive the expression for the same.	C205.1	U&AZ
	Or		
12	Draw the circuit diagram and explain the working of full wave bridge rectifier and derive the expression of average output current and ripple factor	C205.1	R &U
13	Explain about LED and Laser diode.	C205.1	R&U
	Or		
14 a	Explain zener diode as voltage regulator	C205.1	R&U
14 b	An AC voltage of 220V, 50Hz is applied to a half wave rectifier through a transformer of turns ratio of 10:1. Find rms and average value of load current, efficiency, ripple factor, PIV, ripple frequency, ripple current and voltage.	C205.1	R&U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the construction and working of NPN transistor. Comment on the characteristics.	C205.2	R &U
	Or		
16	Explain the construction and working of CB amplifier. Comment on the characteristics.	C205.2	R &U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Course handling faculties
Dr. S. Thamizharasan Asso.Prof/ EEE
Mr.R.Sridhar, AP/EEE

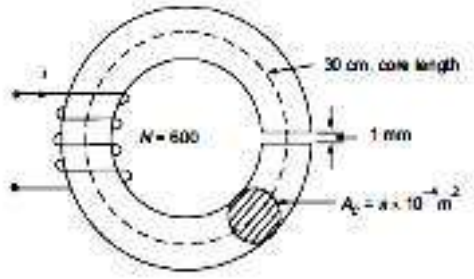
Saranathan College of Engineering
Tiruchirapalli

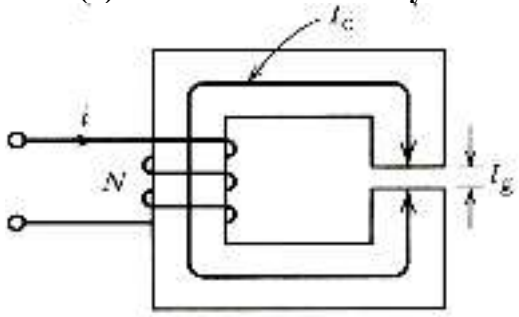
Internal Assessment Test - I			Date/ Session	20-07-2019/ FN	Marks	50
Course code	EE8301	Course Title	Electrical Machines - I			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A (Answer all the questions 10 x 2 = 20 marks)

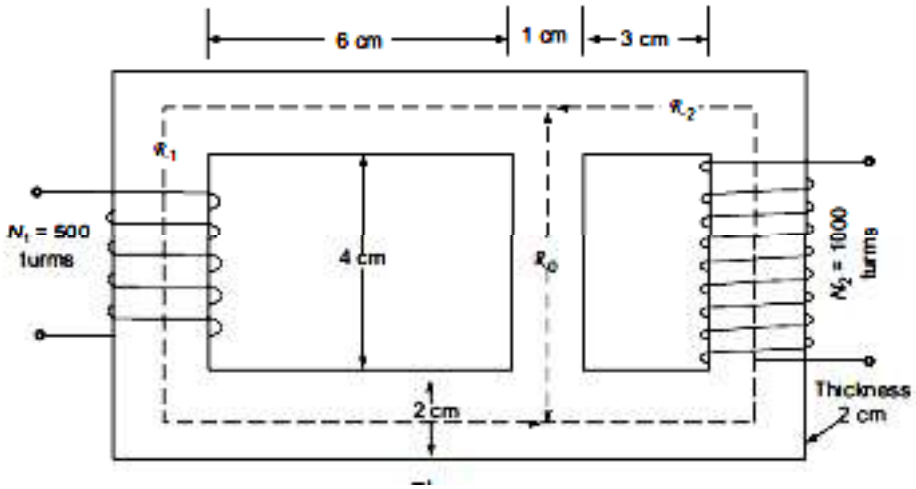
Q. No.	Questions	CO	Skills
1	State Ohm's law for magnetic circuits.	C204.1	R
2	What is meant by fringing in magnetic systems?	C204.1	U
3	A current of 20mA is passed through a coil of self-inductance 500mH. Find the magnetic energy stored. If the current is halved, find the new value of energy stored and the energy released back to the electrical circuit.	C204.1	E
4	What is meant by motional emf? Give example.	C204.1	U
5	Define Lorentz Force in magnetic system.	C204.1	R
6	Define stacking factor of magnetic core.	C204.1	R
7	List any four types of permanent magnet materials.	C204.1	R
8	Does the transformer draw any current when secondary is opened? Why?	C204.2	
9	What are the properties of an ideal transformer?	C204.2	U
10	If a transformer has 50 turns in the primary winding and 10 turns in the secondary winding, what is the reflective resistance if the secondary load resistance is 250 Ω?	C204.2	E

Part – B (Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	A wrought iron bar 30 cm long and 2 cm in diameter is bent into a circular shape as shown in Fig. 1. It is then wound with 600 turns of wire. Calculate the current required to produce a flux of 0.5 mWb in the magnetic circuit in the following cases: (i) no air-gap; (ii) with an air-gap of 1 mm; μ_r (iron) = 4000 (assumed constant); and (iii) with an air-gap of 1 mm; assume the following data for the magnetization of iron: H in AT/m 2500 3000 3500 4000 B in T 1.55 1.59 1.6 1.615  Figure 1	C204.1	E
	OR		
12	For the magnetic circuit of Fig. 2. N=400 turns. Mean core length l_c =50		

	cm. Air gap length l_g =1:0 mm. Cross-sectional area Ac =Ag =15 cm^2. Relative permeability of core μ_r =3000. i=1.0 A. Find (a) Flux and flux density in the air gap. (b) Inductance of the coil.  Figure 2	C204.1	E
13	Explain briefly the construction and working principle of transformer	C204.2	U
	OR		
14	Derive an expression for emf equation of transformer with special attention on Transformation ratio.	C204.2	A

Part – C (Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	For the magnetic circuit of Fig. 3 find the self and mutual inductances between the two coils. Core permeability = 1600. Figure 3  	C204.1	E
	OR		
16	(a) The total core loss of a specimen of silicon steel is found to be 1500 W at 50 Hz. Keeping the flux density constant the loss becomes 3000 W when the frequency is raised to 75 Hz. Calculate separately the hysteresis and eddy current loss at each of those frequencies.(6) (b) Find the eddy current power loss in a 50 Hz transformer with a maximum flux density of 1 Wb/m2. The core is of section 8 cm × 6 cm and total effective length is 50 cm constructed of laminations of thickness 0·4 mm. The eddy current coefficient is $6{\cdot}58 \times 10^6$. Assume a space factor of 0·9(4).	C204.1	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty : P. Ramesh Babu (AP/EEE) & R. Balasubramanian(Asso.Prof/EEE)

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/ Session	18.07.2019 /FN	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A (Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Convert $(475.25)_8$ to its decimal equivalent & $(549.B4)_{16}$ to its binary equivalent	C201.1	E
2	What is an unit distance code? Give an example.	C201.1	R
3	State Demorgan's theorem.	C201.1	R
4	Convert the following binary to gray code:1010111000_2.	C201.1	E
5	Perform (11011-100101) using 2's complement.	C201.1	E
6	Write down the truth table of full subtractor.	C201.2	A
7	Write the POS representation of the following: f(x,y,z) = ∑m(0,1,3,5,7).	C201.2	U,A
8	Draw the logical diagram for EX-OR gate using NAND gates.	C201.2	U,A
9	Simplify the expression Z= $AB + A\overline{B}.(\overline{\overline{A}.\overline{C}})$.	C201.2	U,A
10	Convert the given expression in canonical SOP form Y= AC+AB+BC.	C201.2	U,A

Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Perform the following addition using BCD and Excess-3 addition (205+569).	C201.1	E
11 b	Encode the binary word 1011 into seven bit odd parity hamming code.	C201.1	E
	Or		
12	A 12 bit Hamming code word is read from memory. What was the original 8 bit data word that was written into memory if the 12 bit word read out is as (1)101110010100 (2)111111110100	C201.1	E
13	Design a 4 bit excess 3 code to BCD converter and implement using logical gates.	C201.2	U,A
	Or		
14 a	Reduce the following function using K-map. f(A,B,C,D)=ΠM(0,2,3,8,9,12,13,15)	C201.2	A
14 b	Simplify the following function using Karnaugh map. f(w,x,y,z)=∑m(0,1,3,9,10,12,13,14)+∑d(2,5,6,11)	C201.2	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Implement the switching function F=∑(0,1,3,4,12,14,15) using an 8 input multiplexer and write its application(8+2)	C201.2	AZ
	Or		
16	Implement a full adder using half adders and MUX.(7+3)	C201.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff Incharge: Dr.S. Vijayalakshmi / Asso. Prof / EEE & R.S. Priyaadharshini /AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date	19-7-19	Marks	50
Course code	EE8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Faraday's law	C203.5	R
2	Distinguish between conduction and displacement currents.	C203.5	R
3	Distinguish between transformer emf and motional emf.	C203.5	R
4	Calculate the emf induced in a circuit having an inductance of 700H if the current through it varies at a rate of 5000A per second.	C203.5	AZ
5	What is the relation between Circuit theory and Field theory?	C203.5	R
6	Define propagation constant.	C203.6	R
7	Define intrinsic impedance or characteristic impedance. Give the intrinsic impedance of free space.	C203.6	R
8	Define skin depth.	C203.6	R
9	Mention the properties of uniform plane waves.	C203.6	R
10	Define poynting theorem.	C203.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	With necessary explanation, derive the set of Maxwell's equation in differential and integral forms.	C203.5	R
	or		
12	Derive the expression for relation between field theory and circuit theory using RLC series circuit.	C203.5	R
13	Derive the equation for electromagnetic waves in Free space.	C203.6	R
	or		
14	Derive the Poynting theorem and state its significance.	C203.6	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A plane wave propagation through a medium with ε_r=8, μ_r= 2 has E=0.5sin (10^6t-βz) $\vec{a}_x$(V/m). Find (a) attenuation constant (b) Phase Constant (c) velocity of propagation (d) wavelength (e) intrinsic impedance.	C203.6	AZ
	or		
16	A lossy dielectric is characterized by ε_r =2.5, μ_r =4, and σ=10^{-3} S/m at a frequency 10 MHz. Find (a) propagation constant (b) attenuation constant (c) Phase Constant (d)velocity of propagation (e) wavelength (f) intrinsic impedance.	C203.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Name of the faculty : N.Vijayasarathi & N. Gayathri

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date	23.07.2019	Marks	50
Course code	ME8792	Course Title	POWER PLANT ENGINEERING			
Batch No.		Duration	90 mins	Academic Year		2019 - 2020
Year/	II	Semester/Section	III / A&B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Describe the processes of Rankine cycle.	C206.1	R
2	What do you understand by compounding of steam turbines? Mention the different types of compounding done in impulse turbines.	C206.1	AZ
3	Write the expression for power input of ID fan.	C206.1	R
4	What is cooling efficiency?	C206.1	U
5	Write any four characteristics of ideal fluid for vapour power cycle.	C206.1	U
6	Define steam rate.	C206.1	R
7	What do you understand by the term boiler draught?	C206.1	U
8	What are the different processes involved in Otto cycle?	C206.2	R
9	Draw the T-s diagram for Diesel cycle.	C206.2	A
10	Define compression ratio.	C206.2	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Draw general layout of steam power plant with neat diagram and explain the working of different circuits	C206.1	U
	or		
12	What is cogeneration power plant? Explain different cogeneration power plants with necessary diagrams.	C206.1	AZ
13	Explain with neat diagram the working of Benson and Lamont boilers.	C206.1	AZ
	or		
14	Draw and explain the working of FBC boilers.	C206.1	U
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	Along with T-s and p-v diagram explain the various processes involved in Otto cycle and obtain the cycle efficiency.	C206.2	U
	or		
16	Along with T-s and p-v diagram explain the various processes involved in Diesel cycle and obtain its efficiency	C206.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/Session	23.07.19/FN	Marks	50
Course code	OMD551	Course Title	Basics of Biomedical Instrumentation			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	III	Semester/Section	V / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Name different types of electrodes used for biomedical instrumentation system.	C206.1	AZ
2	What are the salient features of needle electrode?	C206.1	AZ
3	Distinguish between metallic microelectrode and non-metallic microelectrodes.	C206.1	U
4	Define ECG, EEG, EMG and ERG.	C206.1	U
5	Draw the waveform of bio electric signal	C206.1	S
6	List the major recording problems	C206.1	U
7	What are different types of bio signals	C206.1	R
8	Draw Eithovens triangle	C206.2	R
9	Write a short notes on Standard 12 lead system for ECG wave measurement	C206.2	A
10	Draw the ECG waveform	C206.2	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	What is diameter of tip of the micro electrode? Why it should be so small? Explain. Draw the electrical equivalent circuit of microelectrode and explain its electrical nature.	C206.1	A
	or		
12	Draw and expain the bio electrical signal with action potential and resting potential	C206.1	U
13	Write a short notes of bio signal characteristics and list out frequency and amplitude ranges of all types of biosignal	C206.1	A
	or		
14	Explain in detail ECG and draw Einthoven s triangle with detailed information	C206.1	U

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	Discuss in detail recording problems bio potential generation	C206.2	U
	Or		
16	Explain in detail, Measurement of with two electrodes	C206.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

SARANATHAN COLLEGE OF ENGINEERING

Tiruchirappalli

Internal Assessment Test - I			Date/Session	22.07.19/FN	Marks	50
Course code	EE6005	Course Title	POWER QUALITY			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	IV	Semester/Section	VII/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define at least five power quality issues	C405E4.1	R
2	Define power Quality	C405E4.1	R
3	Define Voltage sag	C405E4.1	R
4	Explain non-linear load with examples	C405E4.1	A
5	What is voltage imbalance in power quality?	C405E4.1	R
6	Mention the parameters in which the equipment sensitive to voltage sag.	C405E4.2	A
7	What are the various factors affecting the sag magnitude due to faults at a certain point in the system?	C405E4.2	A
8	Define minimum voltage sag ride through capability.	C405E4.2	R
9	What are the causes of Sag?	C405E4.2	A
10	When sag leads to an interruption?	C405E4.2	AZ

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Explain the basic steps involved in power quality evaluation	C405E4.1	U
	or		
12	Explain the CBEMA and ITI curve with a diagram	C405E4.1	R
13	Classify waveform distortion and explain each with proper diagram	C405E4.1	AZ
	or		
14	Explain the categories and characteristics of power system Electromagnetic phenomena	C405E4.1	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

15	Explain the general procedure for Estimating voltage sag performance and area of vulnerability	C405E4.2	AZ
	or		
16	Discuss about the effects of voltage sag and interruption on various electrical equipment	C405E4.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In-charge: Ms.C.Pearline Kamalini & Mr.T.Tamilarasan

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/Session	23-07-19	Marks	50
Course code	EE6008	Course Title	MICROCONTROLLER BASED SYSTEM DESIGN			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	IV	Semester/Section	VII / 'A & B'	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Mention the different peripherals available in PIC16Cx family of microcontroller	C406.1	R
2	Draw the Harvard and Von- Neumann architectures	C406.1	R
3	What is the advantage of Harvard architecture over Von- Neumann architectures?	C406.1	U
4	Write the significance of Brown-out-reset and watchdog timer	C406.1	U
5	Mention any 3 instructions used for data transfer in PIC16x microcontroller and give its syntax	C406.1	R
6	Mention the different addressing modes in PIC microcontroller.	C406.1	R
7	Write the significance of timer 2 over the other timers in PIC16x	C406.2	U
8	What is meant by Polling routine and Mainline overrun?	C406.2	U
9	What is the Role of GIE in PIC microcontrollers?	C406.2	U
10	Consider a Crystal frequency of 1MHz with Prescaler (C=4), main scaler (B=250) and post scaler (A=2). Find the Period value in time.	C406.2	E

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Draw and explain the architecture of the PIC16C74A microcontroller	C406.1	U
	or		
12	Briefly explain about the different addressing modes in PIC16X	C406.1	U
13	Explain the given instructions with example. 1. ADDWF (d=1) 2. BCF(use indirect addressing mode) 3. MOVLW	C406.1	A
	or		
14	Explain the Harvard architecture along with instruction pipelining	C406.1	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the interrupt logic using timer2 interrupt (PIC16C74A) with necessary circuits	C406.2	U
	or		
16	Explain in detail about the interrupt service routine and loop time subroutines along with example programs.	C406.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Staff In-Charge : B. Paranthagan/Asso. Prof./EEE, & Dr.S. Vijayalakshmi/Asso. Prof/EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test - I			Date/ Session	19/07/2019	Marks	50
Course code	EE6703	Course Title	SPECIAL ELECTRICAL MACHINES			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	IV	Semester/ Section	VII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	List the types of rotor available in SyRM.	C403.1	R
2	Define reluctance torque with reference to SyRM.	C403.1	R
3	Draw the torque angle characteristics of SyRM.	C403.1	A
4	Write down the applications of SyRM.	C403.1	A
5	Mention the design considerations of SyRM.	C403.1	R
6	Define the term step angle.	C403.2	R
7	Mention the applications of stepper motor.	C403.2	A
8	Distinguish Half step and full step operations of stepper motor.	C403.2	AZ
9	Define Detent torque.	C403.2	R
10	What are the different modes of excitation in stepper motor?	C403.2	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the construction details and working principle of Synchronous Reluctance Motor with a neat diagram with their merits and demerits.	C403.1	U
	Or		
12	Explain the construction and working of Vernier motor.	C403.1	U
13	Explain the phasor diagram and characteristics of Synchronous Reluctance Motor	C403.1	AZ
	Or		
14	Describe and explain the Torque-Speed characteristics and Torque-Angle characteristics of Synchronous Reluctance Motor	C403.1	U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the modes of operation of variable reluctance stepper motor.	C403.2	A
	Or		
16	Explain the operation of Permanent Magnet stepper motor.	C403.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/Session	17.07.19/FN	Marks	50
Course code	EE6701	Course Title	High Voltage Engineering			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	IV	Semester/Section	VII/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is back flashover?	C401.1	R
2	State the parameters and the characteristics of the lightning strokes	C401.1	C
3	What is an expulsion gap?	C401.1	U
4	What are the various types of surge arresters used for EHV and UHV systems?	C401.1	A
5	Define Isokeraunic level or thunderstorm days	C401.1	R
6	List some sources causing switching surges	C401.1	AZ
7	Mention the gases used as the insulating medium in electrical apparatus	C401.2	R
8	What are electronegative gases?	C401.2	R
9	What is the Townsend's condition for breakdown?	C401.2	AZ
10	Define statistical time lag and formative time lag	C401.2	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	What are the mechanisms by which lightning strokes develop and induce over voltages on overhead power lines? Give the mathematical models for lightning discharges and explain them	C401.1	A
	or		
12	Write short a note on (i) Rod gaps as protective devices (ii) Ground wires for protection of overhead lines	C401.1	U
13	From the fundamental principle, derive Townsend's Criteria for the breakdown of gaseous dielectric medium	C401.2	A
	or		
14	a. Discuss the streamer theory of breakdown in gases. b. Explain the various mechanism of vacuum breakdown	C401.2	R
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	What are the different method employed for the lightning protection of overhead lines?	C401.1	AZ
	or		
16	Explain the different theories of charge formation in clouds	C401.1	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty:

Dr.M.V.Suganyadevi, ASP/EEE, Dr.K. RajKumar, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/Session	18-07-19	Marks	50
Course code	EE6702	Course Title	Protection and Switchgear			
Batch No.		Duration	90 mins	Academic Year		2019 - 2020
Year	IV	Semester/Section	VII / A & B	Department		EEE

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define PSM & burden on CT in a relay.	C402.1	R
2	What are the necessities of grounding?	C402.1	U
3	What are the functions of protective schemes?	C402.1	U
4	Define the term pickup and reach of a relay.	C402.1	R
5	Why earth wire is provided in overhead transmission line?	C402.1	U
6	Define protective zone.	C402.1	R
7	Classify the different types of faults in power system and which of these are more frequent occurrence of fault?	C402.1	U
8	In what way a distance relay is superior to overcurrent protection relay for transmission line?	C402.2	U
9	What are the advantages of static relay?	C402.2	U
10	What is the principle of differential relay?	C402.2	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Discuss in detail about Peterson coil and list the protective functions performed by this device with neat sketch. (10)	C402.1	U
	Or		
12	Explain in detail the fault current calculation using symmetrical components with example. (10)	C402.1	U
13	Describe the functional requirements of protective schemes. (10)	C402.1	U
	Or		
14	Explain in detail about various zones of protection with their types. (10)	C402.2	U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the construction and operating principles of induction type directional over current relay. (10)	C402.2	U
	Or		
16	What is distance relay and explain their types with neat sketch. (10)	C402.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	21.08.19/FN	Marks	50
Course code	EC8353	Course Title	Electron Devices and Circuits			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	II	Semester/ Section	III / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Questions	CO	Skills
1.	State any three differences between BJT and FET.	C201.2	U
2.	When V_{GS} of FET changes from-3.1V to -3V, I_D changed from 1mA to 1.3mA, find the value of transconductance.	C201.2	U A
3.	Determine I_B of a CE circuit if I_E=80mA and β=170.	C201.2	R A
4.	Define latching and holding current of a thyristor.	C201.2	R
5.	Calculate the intrinsic strand-off ratio of a UJT if R_{B1}=5 kΩ and inter-base resistance is 10 kΩ.	C201.2	R A
6.	Draw the hybrid circuit model for common emitter configuration.	C201.5	UR
7.	When the negative feedback is applied to an amplifier of gain 100, the overall gain is reduced to 50. Determine the feedback ratio.	C201.6	A
8.	State Barkhausen's criterion for sustained oscillations in an oscillator.	C201.5	R
9.	For a phase shift oscillator, the feedback network uses R=6 kΩ, C= 1500pF. If R_C of an amplifier is 18 kΩ, find the frequency of oscillation and the minimum gain of the transistor.	C201.5	A
10.	Mention the Characteristics of negative feedback.	C201.6	UR

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	CO	Skills
11.	Explain about N-Channel Enhancement MOSFET along with its characteristics.	C201.2	U AZ
	OR		
12.	Explain about the following biasing methods in a transistor. Self bias with emitter feedback & Voltage divider feedback.	C201.2	U AZ
13.	Explain the construction and working of Colpitt's oscillator with neat diagram. Write the expression of frequency of oscillation and the gain of the amplifier.	C201.6	UR
	OR		
14.	Explain about Wein Bridge oscillator and derive the frequency of oscillation.	C201.6	U AZ

Part – C (Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	CO	Skills
15.	Explain the construction and working principle of SCR.	C201.2	U R
	OR		
16.	Design the voltage divider bias of a transistor such that V_{CE} = 12V, I_C = 2mA, β = 50, V_{BE}= 0.7V, V_{CC} = 24V, R_C = 4.7 kΩ, Stability factor, S≤5.1	C201.2	U A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Members: Dr. S.Thamizharasan, ASP/EEE; Mr.R.Sridhar, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/Session	16.8.2019/FN	Marks	50
Course code	EE6701	Course Title	HIGH VOLTAGE ENGINEERING			
Batch No.		Duration	90 Mins	Academic Year	2019 - 2020	
Year/	IV	Semester/Section	VII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q.No.	Questions	CO	Skills
1	Define tracking index.	C401.2	U
2	On what factors does liquid dielectric is selected?	C401.2	AZ
3	List the properties of good dielectric materials.	C401.2	R
4	Mention any four examples of solid dielectric materials used in electrical systems.	C401.2	R
5	Draw a circuit diagram of a simple voltage doubler.	C401.3	R
6	Write the expression to find the optimum number of stages in a voltage multiplier circuit.	C401.3	AZ
7	What are the advantages of high frequency resonant transformer used in HVAC generation?	C401.3	AZ
8	Draw the standard impulse wave and mention the specifications.	C401.3	R
9	What are the types of wave form will be available in impulse current generator output?	C401.3	U
10	How are capacitances connected in an impulse current generator?	C401.3	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q.No.	Questions	CO	Skills
11	Explain various theories of breakdown mechanism of the commercial liquid dielectrics.	C401.2	AZ
	Or		
12	Explain the different mechanisms by which the breakdown occurs in solid dielectrics.	C401.2	U
13	Describe the cascaded transformer connection to generate high alternating voltages.	C401.3	U
	Or		
14	Describe with neat diagram the principle of operation, advantages, limitations and applications of Van de Graff generator..	C401.3	U

Part – C (Answer all the questions 1 x 10 = 10marks)

15	Obtain the expression for voltage ripple, voltage drop and optimum number of stages in a Cockroft-Walton voltage multiplier circuit for generation of high DC voltages.	C401.3	AZ
	Or		
16	Give the Marx circuit arrangement for multistage impulse generator. How is the basic arrangement modified to accommodate the wave time control resistances?	C401.3	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

FACULTY : Dr.M.V.Suganyadevi, ASP/EEE, Dr K.Rajkumar, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/ Session	21-08-19 / FN	Marks	50
Course code	EE8551	Course Title	Microprocessor and Microcontrollers			
Batch No.		Duration	90 mins	Academic Year	2019	
Year/	III	Semester/ Section	V / B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	List the features of timer.	C302.3	U
2	What are the flags available in 8051 processor	C302.3	R
3	Give the difference between vectored and non vectored interrupts.	C302.3	U
4	Mention the use of ALE.	C302.3	U
5	What is the use of stack pointer?	C302.3	A
6	Mention the difference between microprocessor and microcontroller	C302.3	A
7	Explain any one logical instruction with an example.	C302.2	R
8	How many ports are available in 8051 microcontroller.	C302.3	A
9	List out the application of 8051 microcontroller.	C302.3	A
10	What is the significance RST pin in 8051 processor.	C302.3	A

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Explain with a neat block diagram, the architecture of 8051 microcontroller.	C303.3	R
	OR		
12	Draw the pin configuration of 8051 and explain the purpose of each signal.	C303.3	R
13	Briefly discuss about the memory organization of 8051 microcontroller.	C303.3	AZ
	OR		
14	Explain in detail about the interrupts of 8051 processor.	C303.3	R

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	List out the classification of instructions in 8085 processor. Explain any two instructions for each type .	C302.2	AZ
	OR		
16	Write a program to multiple two numbers using 8085 processor.	C302.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Incharge: M.Marimuthu&S.RamPrasath,AP,EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/ Session	17.8.2019 / FN	Marks	50
Course code	EE8552	Course Title	Power Electronics			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year/	III	Semester/ Section	V / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Mention some applications of Converters.	C303.3	R
2	What is meant by phase control?	C303.3	R
3	Why power factor of semiconverter is better than full converter?	C303.3	AZ
4	What is the function of freewheeling diode in controlled rectifiers?	C303.3	R
5	Give the expression for average output voltage of three phase full wave converter feeding RL load with continuous current conduction.	C303.3	R
6	What is step up cycloconverter?	C303.6	R
7	List the merits and demerits of AC voltage controller.	C303.6	R
8	Give the expression for RMS output voltage of single phase full wave ac voltage controller.	C303.6	A
9	List out the applications of AC voltage controller.	C303.6	R
10	Explain the types of cycloconverter.	C303.6	R

Part – B

(Answer all the questions 2 x 10 = 20 marks) Maximum 2 splits/Question

Q. No.	Questions	CO	Skills
11	Describe the operation of three phase semiconverter with R load and also draw the output voltage waveforms for 30° and 90°.	C303.3	R
	OR		
12	Explain the operation of a three phase ,fully controlled bridge converter with associated waveforms.	C303.3	R
13	Draw and Describe the circuit diagram of single phase AC voltage controller with RL load. Explain the circuit operation with necessary waveforms.	C303.6	R
	OR		
14	A single phase full wave AC voltage controller has an input voltage of 230V 50Hz and it is feeding a resistive load of 10 Ohms.If the firing angle of thyrisitor is 110 degree. Calculate the output RMS voltage , input power factor and average current of thyristor.	C303.6	R

Part – C

(Answer all the questions 1 x 10 = 10 marks) Case study or Analytical type

Q. No.	Questions	CO	Skills
15	Describe the operating principle of single phase to single phase cycloconverter with continuous and discontinuous load current with circuit and waveform.	C303.6	**A**
	OR		
16	Write a short note on the single phase Step-up cycloconverter.	C303.6	**A**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Subject handling Faculty : R.Balasubramanian / Assoc Prof / EEE & S.Sivakumar / AP / EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	19.08.2019/ FN	Marks	50
Course code	EE8591	Course Title	Digital Signal Processing			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	III	Semester/ Section	V/A & B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is the relationship between Z-transform and DTFT?	C304.2	U
2	State the condition for existence of DTFT?	C304.2	U
3	Define system function.	C304.2	R
4	Find the DFT sequence of x(n) = {1,1,0,0}	C304.3	A
5	State and proof the circular frequency shifting property of DFT	C304.3	A
6	What is zero padding?	C304.3	R
7	Draw the basic butterfly structure of DIT FFT algorithm	C304.3	U
8	What are the applications of FFT algorithms?	C304.3	A
9	Calculate the percentage saving in calculations in a 256 point radix-2 FFT, when compared to direct DFT.	C304.3	A
10	Determine the convolution sum of two sequences x(n) = {3,2,1,2} and h(n) = {1,2,1, 2}.	C304.3	A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Obtain the inverse Z-transform of $X(Z) = Z^2 / Z^2+1.5Z+0.5$ for ROC (i) $\|z\| > 1$ (ii) $\|z\| < 0.5$ (iii) $0.5 < \|z\| < 1$ using any two methods. (5+5)	C304.2	AZ
	or		
12	(i) Find the impulse response of the discrete time system described by the difference equation $y(n-2) - 3y(n-1) + 2y(n) = x(n-1)$ (5) (ii) Determine the discrete time Fourier transform of $x(n) = a^{\|n\|}$, $\|a\| < 1$ (5)	C304.2	AZ
13	Determine the 8 point DFT of the signal x(n) = {1,1,1,1,1,1,0,0}and sketch its magnitude and phase.	C304.3	AZ
	or		
14	(i) Find the IDFT of the sequence X(k) = {6, -2+2j, -2, -2-2j} (5) (ii) Obtain the circular convolution of $X_1(n)$= {1, 2, 2, 1} and $X_2(n)$ ={1, 2, 3, 1} (5)	C304.3	AZ
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	An 8-point sequence is given by compute 8 point DFT of x(n) = {2,2,2,2,1,1,1,1} is given by (i) Radix-2 DIF-FFT	C304.3	AZ
	or		
16	Find the 8 point DFT of the sequence of x(n) = {1/2, 1/2, 1/2, 1/2, 0,0,0,0} using decimation in time radix-2 FFT algorithm	C304.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.P.Ram Prakash, AP/EEE, Ms.A.R.Danila Shirly, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	17/08/2019	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	II	Semester/ Section	III/A&B	Department	EEE	

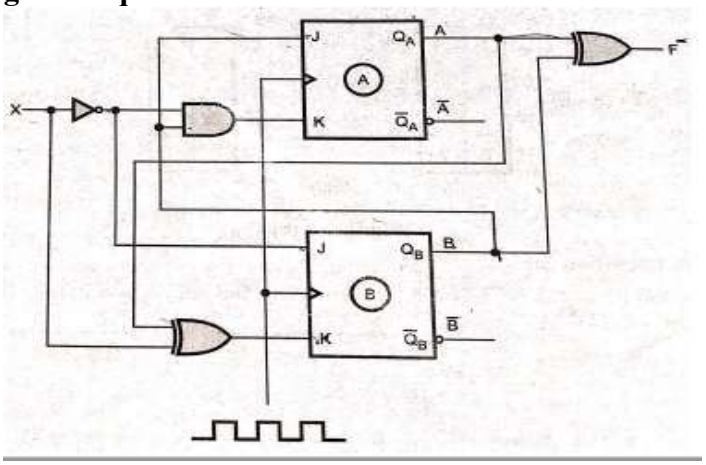
Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What do you mean by race around condition in a flip-flop?	C201.3	U
2	Convert SR flip-flop to D flip-flop?	C201.3	A
3	What are the types of triggering in the flip-flops?	C201.3	R
4	Differentiate between mealy and moore models.	C201.3	R
5	Differentiate a Synchronous Sequential Circuit and Asynchronous Sequential Circuit.	C201.3	R,U
6	Give the state diagram of SR and T flip-flop.	C201.3	R,A
7	Give the excitation table of JK And D flip-flop.	C201.3	R,A
8	Define Preset and Reset	C201.3	R,C
9	Write the characteristic equation of SR-FF and T-FF	C201.2	AZ
10	Differentiate between a encoder and MUX.	C201.2	R,A

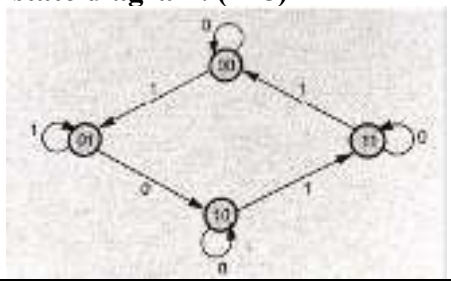
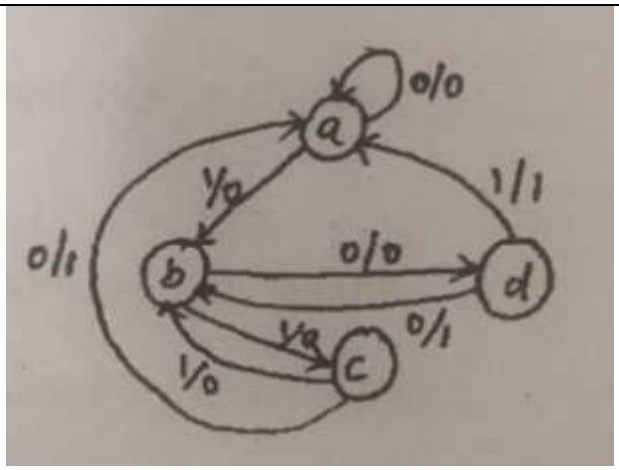
Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Implement full subtractor using demultiplexer.	C201.2	E,U
11 b	Implement Octal to Binary encoder	C201.2	E,U
	or		
12	Design 7-segment display decoder	C201.2	AZ
13	Construct the transition table, state table, and state diagram for the given sequential circuit below. 	C201.3	AZ
	or		
14 a	Explain in detail about different shift registers.(7)	C201.3	U,E
14 b	Explain the realization of JK flip flop from T flip flop.(3)	C201.3	E,A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	**Define a state diagram. Design a synchronous sequential circuit using JK-FF for the given state diagram. (2+8)** 	C201.3	AZ
	or		
16	 **Design a clocked sequential machine using T FF for the following diagram. Use state reduction if possible.**	C201.3	AZ

Staff Incharge : Dr.S. Vijayalakshmi/Asso. Prof/EEE/R.S. Priyaa Dharshini/AP/EEE

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – II			Date/Session	19.8.19	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2019– 2020	
Year	II	Semester/Section	III/ A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Divergence theorem	C203.1	R
2	State Stokes theorem	C203.1	R
3	State the condition for vector A to be a) solenoidal b) irrotational	C203.1	R
4	Point P & Q are located at point (0,2,4) and (-3,1,5). Calculate the distance vector from P to Q	C203.1	A
5	Write the formula for transformation of vector from Cartesian to Cylindrical	C203.1	R
6	Mention the source and effects of electromagnetics.	C203.1	R
7	Define Coulomb's Law	C203.2	U
8	Define Electric field intensity and give its unit.	C203.2	U
9	Define Gauss's Law	C203.2	U
10	Find the force in Newton on charge Q_1 = 20 μC situated at (0, 1, 2) m due to charge Q_2 = 300 μC situated at (2, 0, 0) m.	C203.2	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	If $\vec{G} = 10e^{-2z}(\rho\vec{a_\rho} + \vec{a_z})$, Determine the flux of $\vec{G}$ out of the entire surface of the cylinder $\rho = 1, 0 \le z \le 1$. Confirm the result by using divergence theorem.	C203.1	AZ
	Or		
12	Express vector $\vec{B} = \frac{10}{r}\vec{a_r} + r\cos\theta\,\vec{a_\theta} + \vec{a_\phi}$ in Cartesian and Cylindrical coordinates. Find $\vec{B}(-3,4,0)$ and $\vec{B}\left(5,\frac{\pi}{2},-2\right)$	C203.1	AZ
13	Derive an expression for Electric Field Intensity at a point due to finite and an infinite conductor of wire.	C203.2	U
	Or		
14	Derive an expression for Electric Field Intensity at a point due to infinite sheet	C203.2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Determine the divergence and curl of these vector fields. a) $\vec{A} = yz\,\vec{a_x} + 4xy\,\vec{a_y} + y\,\vec{a_z}$ at (1,-2,3); b) $\vec{B} = \rho z \sin\phi\,\vec{a_\rho} + 3\rho z^2\cos\phi\,\vec{a_\phi}$ at (5,π/2,1) ; c) $\vec{C} = 2r\cos\theta\cos\phi\,\vec{a_r} + r^2\vec{a_\phi}$ at (1,π/6, π/3)	C203.1	AZ
	Or		
16	Verify divergence theorem, where $\vec{A} = 2xy\,\vec{a_x} + y^2\vec{a_y} + 4yz\,\vec{a_z}$ and S is the surface of the cube bounded by x = 0, x = 1, y = 0, y = 1, z = 0, z = 1.	C203.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Name of the faculty: N.Vijayasarathi & N.Gayathri

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	20-08-2019/ FN	Marks	50
Course code	EE8301	Course Title	Electrical Machines - I			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	What happens if DC supply is applied to the transformer?	C204.2	R
2	Full load copper loss is 1600 watts, what will be the loss at half load?	C204.2	E
3	Draw the phasor diagram of transformer on no load.	C204.2	U
4	What is the condition for maximum efficiency of transformer?	C204.2	R
5	Define voltage regulation of a transformer.	C204.2	R
6	O.C test is always conducted on L.V side-Why?	C204.2	R
7	Give examples for continuous energy conversion equipments and force producing devices.	C204.3	R
8	Define field energy.	C204.3	
9	Draw the general block diagram of electromechanical energy conversion device.	C204.3	U
10	Energy stored in a magnetic field occurs mainly in the air gap-Why?	C204.3	U

Part – B(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Draw and explain the phasor diagram of single phase transformer operating on upf, lagging and leading load.	C204.2	U
	OR		
12	What is meant by inrush current in transformer? Specify the nature of inrush currents and its problem during transformer discharging.	C204.3	U
13	What is meant by singly excited system and derive expressions of field energy and co energy in singly excited electromechanical unit.	C204.3	U
	OR		
14	Derive an expression for force and torque in singly excited system for linear and non linear case.	C204.2	A

Part – C (Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions			CO	Skills
15	Tests are performed on 1Φ ,10kVA, 2200/220V, 60 Hz transformer and the following results are obtained			C204.2	E
	Meter's reading	O.C Test (H.V side Open)	S.C Test (L.V side Short circuited)		
	Voltmeter Ammeter Wattmeter	220 V 2.5A 100 W	150V 4.55A 215W		
	(a) Determine the parameters for approximate equivalent circuit referred to LV side. (b) Determine the voltage regulation in percent for 75% full load 0.6 pf lagging. (c) Efficiency at 75% rated output and p.f 0.6				
	OR				
16	When a single phase transformer is supplied at 400V, 50 Hz, the hysteresis loss is found to be 320 watts and eddy current loss is found to be 250 watts. Determine the hysteresis loss and eddy current loss when the transformer is supply at 800 V, 100 Hz.			C204.2	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	22.08.2019/FN	Marks	50
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	II	Semester/ Section	III / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1.	List the methods of fuel injection in diesel power plant.	C206.2	R
2.	Justify: Auxiliary Power Consumption of Brayton Cycle is almost twice that of Rankine Cycle despite the thermodynamic processes adopted are similar.	C206.2	AZ
3.	List the ways to improve thermal efficiency in Brayton cycle.	C206.2	R
4.	Why gas turbine power plants are more attractive than others?	C206.2	AZ
5.	What is the function of moderators in nuclear reactor?	C206.3	U
6.	Write any one nuclear fission reaction.	C206.3	U
7.	Define "electron Volt" with reference to Nuclear Power plants.	C206.3	R
8.	Why pressurized heavy water reactor is preferred reactor in India?	C206.3	AZ
9.	Define – Binding energy.	C206.3	R
10.	What is meant by nuclear fuel enrichment?	C206.3	U

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11.	List the different methods of cooling diesel engine and explain any two with neat diagram.	C206.2	A
	OR		
12.	Explain in detail about the construction and working of Integrated Gasifier based Combined Cycle system (IGCC).	C206.2	U
13.	With neat sketch, explain the layout of diesel power plant.	C206.2	AZ
	OR		
14.	With neat pv and Ts diagram, explain in detail the Brayton cycle and also derive the expression for thermal efficiency.	C206.2	U

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15.	Discuss in detail the safety measures to be considered while setting up a nuclear power plant.	C206.3	U
	OR		
16.	Explain in detail the components and working of PWR.	C206.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

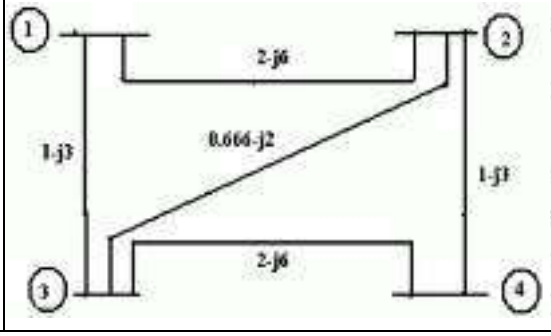
Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/Session	16.8.2019	Marks	50
Course code	EE8501	Course Title	POWER SYSTEM ANALYSIS			
Batch No.	183	Duration	90 mins	Academic Year	2019 - 2020	
Year/	III	Semester/Section	V/A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is Jacobian matrix? How the elements of Jacobian matrix are computed?	C301.2	E
2	Compare G-S method and N-R methods of load flow solutions	C301.2	A
3	How the convergence of N-R method is speeded up?	C301.2	R
4	What are the factors to be considered for selecting the C.B.?	C301.3	A
5	How symmetrical faults are analyzed?	C301.3	A
6	Examine the order of severity and symmetrical fault?	C301.3	R
7	What is the need for short circuit studies?	C301.3	A
8	How are the faults classified?	C301.3	R
9	Define short circuit capacity of power system	C301.3	U
10	Differentiate between sub transient and transient reactance	C301.3	R

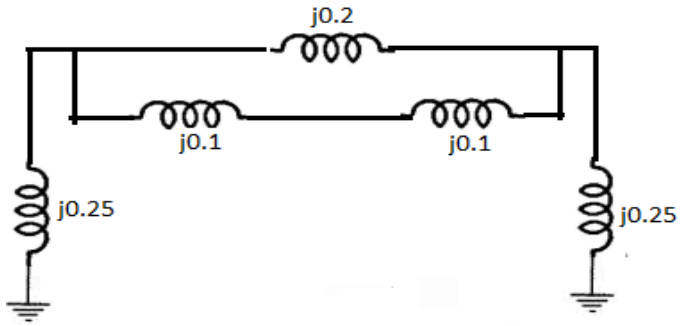
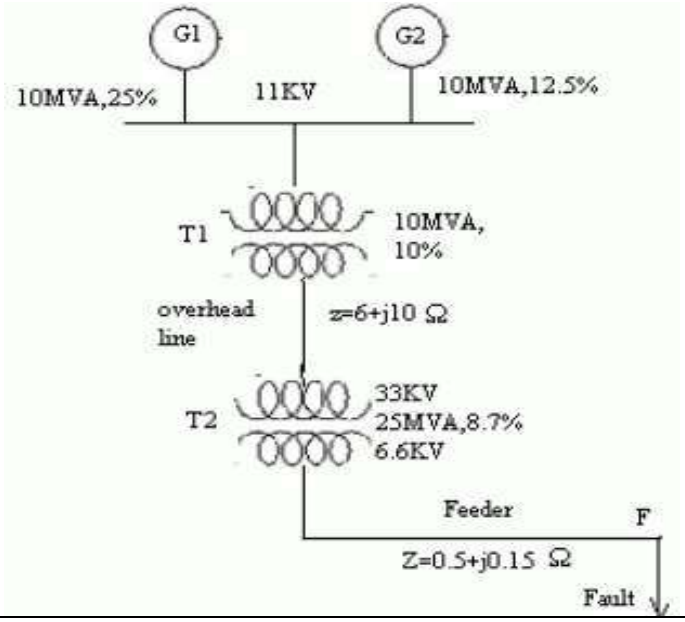
Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	For the sample system shown in the fig. the generators are connected at all four buses while the loads are at buses 2 and 3. Assuming a flat voltage start, examine bus voltages and bus angles at the end of first Gauss seidal iterations and consider the reactive power limitas $0.2 \leq Q2 \leq 1$ 	C301.2	AZ

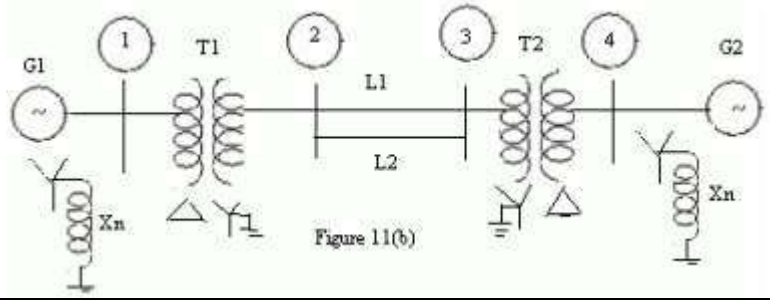
Bus	P in pu	Q in pu	V in pu	Remarks
1	-	-	$1.04\angle 0^{0}$	Slack bus
2	0.5	-	1.04pu	PV bus
3	-1.0	0.5	-	PQ bus
4	0.3	-0.1	-	PQ bus

Or

12	Derive N-R method of load flow algorithm and explain the implementation of this algorithm with the flowchart.	C301.2	E

13	**Find the bus impedance matrix using bus building algorithm for the given network.** 	**C301.3**	**U**
	or		
14	**For the radial network shown in figure , a 3 phase fault occurs at point F. examine the fault current. Use Thevenin's Theorem.** 	**C301.3**	**E**

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	**A symmetrical fault occurs on bus 4 of system shown in figure; examine the fault current, post fault voltages, line flows. Generator G1 ,G2 :100MVA,20KV,X1=15%. Transformer T1, T2:, Xleak=9%, Transmission line L1,L2: X1=10%. Use Bus Building Algorithm**  Figure 11(b)	**C301.3**	**AZ**
	or		
16	**With the help of a detailed algorithm, Explain how a symmetrical fault can be analysed using Z_{Bus}**	**C301.3**	**E**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff In Charge: Dr.M.V.Suganyadevi,ASP/EEE

Mr. R. Sridhar, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	22.08.2019	Marks	50
Course code	OMD 551	Course Title	BASICS OF BIOMEDICAL INSTRMENTATION			
Batch No.		Duration	90 mins	Academic Year		2019 - 2020
Year/	III	Sem. / Sec.	V/A	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define Latency in nerve conduction	C306.2	R
2	Explain Graded and Evoked potentials	C306.2	A
3	Mention the different types of brain waves	C306.2	A
4	Explain Montage of electrodes in EEG.	C306.2	R
5	What is meant by propagation velocity?	C306.2	AZ
6	List out the requirements of bioamplifier.	C306.3	A
7	Define CMRR.	C306.3	R
8	Mention characteristics of ideal and typical operational amplifier.	C306.3	U
9	Justify why differential amplifier is preferred as bioamplifier.	C306.3	R
10	Explain the significance isolation amplifier.	C306.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Describe th 10 – 20 Electrode system used in EEG.	C306.2	R
	or		
12	Describe the recording set up used in EMG.	C306.2	AZ
13	Explain the operation of differential amplifier. In what way it is superior to the single ended amplifier?	C306.3	R
	or		
14	Draw the circuit diagram of an ECG isolation amplifier and explain its operation.	C306.3	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss the different types of noises present in the amplifier circuits. Explain how buffer amplifier can be used as impedance matching circuit.	C306.3	U
	Or		
16	Draw and explain the right-leg driven ECG for improving CMRR.	C306.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Staff: B.Paranthagan

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – II			Date/Session	19/8/2019/FN	Marks	50
Course code	EE8353	Course Title	ELECTRICAL DRIVES AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2019–2020	
Year/	II	Semester/Section	III/A&B	Department	MECH	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define regenerative braking in DC motor.	205.2	U
2	Explain the dynamic braking of induction motor.	205.2	U
3	List the types of Single phase induction motor.	205.2	R
4	What is the necessity of braking?	205.2	E
5	Why a single-phase induction motor cannot self-start?	205.2	U
6	What is the purpose of starter in DC motor?	205.3	U
7	Identify the drawbacks of 3 point starter.	205.3	U
8	What is the advantage of including external resistance R in the rotor circuit of slip ring induction motor?	205.3	U
9	Is regenerative braking possible in DC series motor? Justify	205.3	U
10	What are the types of speed control methods of DC series motor?	205.3	A

Part – B

(Answer all the questions2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Write short note on Autotransformer Starter for three phase induction motor(6)	205.3	A
11 b	Explain the Primary Resistance Starter. (4)	205.3	U
	Or		
12	With neat sketch explain the working of 4-point starter.	205.3	U
13	Explain the types of braking for three phase induction motor.	205.2	E
	Or		
14	Explain the types of electrical braking in DC shunt motor.	205.2	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A Series motor runs at 1000 rpm when the load current is 12A. The series field resistance is 0.8 ohm and armature resistance is 1 ohm. The series field coils are now regrouped from all in series to two in series with two parallel paths. The line current is now 20A. If the corresponding weakening of field is 15%, calculate the speed of the motor. Series motor has 4 poles and rated for 230V.	205.4	U
	Or		
16.	The armature and shunt field resistances of 230V shunt motor are 0.1ohm and 230ohm respectively. It takes a current of 61A at 1000rpm. If the current taken remains unaltered, find the resistance to be included in series with armature circuit to reduce the speed to 750 rpm.	205.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty In-charge: Section'A-Mr.R.Vijay AP/EEE ; Section'B-Mr.S.Sivakumar AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	21.08.2019/FN	Marks	50
Course code	EE6005	Course Title	POWER QUALITY			
Batch No.		Duration	90 mins	Academic Year		2018 - 2019
Year/	IV	Semester/ Section	VII / A&B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define Ferro Resonance.	C405E4.2	A
2.	Write the use of static transfer switch	C405E4.2	R
3.	Draw the diagram for fundamental principle of protection of voltage sag.	C405E4.2	R
4.	How voltage swell differs from transients	C405E4.2	R
5.	What are the causes of short duration interruptions?	C405E4.2	A
6.	Give examples of oscillatory transient voltages	C405E4.3	R
7.	How Over voltages are induced due to lightning?	C405E4.3	AZ
8.	What is the need of low pass filter in transient protection?	C405E4.3	A
9.	What is a clamping device? Give examples.	C405E4.3	U
10.	List the protection methods of cables against over voltages.	C405E4.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	What are the different voltage sag mitigation techniques? Explain in detail	C405E4.2	U
	OR		
12.	Discuss about the transmission and distribution system voltage sag performance evaluation with a neat diagram.	C405E4.2	U, A
13.	Discuss different methods of protection of transformers and cables against over voltages	C405E4.3	U
	OR		
14.	Discuss the about the causes of over voltage transients in detail.	C405E4.3	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Explain Ferro resonance phenomenon and its indicators	C405E4.3	U
	OR		
16.	Discuss in detail about over voltage protection devices.	C405E4.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In-charge: Ms.C.Pearline Kamalini & Mr.T.Tamilasaran

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/Session	22-08-2019 /FN	Marks	50
Course code	EE6008	Course Title	MICROCONTROLLER BASED SYSTEM DESIGN			
Batch No.		Duration	90 mins	Academic Year		2019-2020
Year/	IV	Semester/Section	VII / 'A & B'	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Differentiate between bus operation and bus subroutine	C406.3	R
2	Define baud rate	C406.3	U
3	List out registers associated with UART	C406.3	R
4	What is the value to be loaded into SPBRG register if we want 19200 Baud rate with 10 MHZ clock source.	C406.3	E
5	Microcontroller based control is more advantageous than conventional control - Justify	C406.3	R
6	How temperature sensor is interfaced with PIC Microcontroller?	C406.3	U
7	What are the various elements of UART?	C406.3	U
8	What is accuracy in DAC?	C406.3	U
9	List the various registers used in A/D conversion.	C406.3	U
10	What is the role of master and slave operation performed by the I2C?	C406.3	E

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Exhibit the operation I2C bus and develop embedded C program to transmit data using I2C bus.	C406.3	U
	or		
12	Explain the PIC interfacing with peripherals that includes ADCs with timer and sensors.	C406.3	U
13	Explain the process and procedure to display constant strings and variable strings.	C406.2	A
	or		
14	Explain the Key switch subroutine algorithm with neat flowchart. Also illustrate programming examples.	C406.2	A
15	Explain briefly about various operation performed by EEPROM chip.	C406.3	U
	or		
16	Explain the features and operation of UART in PIC 16CXX microcontroller.	C406.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Staff In-Charge : B. Paranthagan /Asso. Prof/EEE, Dr.S. Vijayalakshmi /Asso. Prof./EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test - II			Date/ Session	19/08/2019 FN	Marks	50
Course code	EE6703	Course Title	SPECIAL ELECTRICAL MACHINES			
Batch No.		Duration	90 mins	Academic Year	2018 - 2019	
Year	IV	Semester/ Section	VII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	List the types of Current Suppressor circuits.	C403.2	R
2	Differentiate between VR and PM Stepper Motor.	C403.2	A
3	A variable reluctance Stepper Motor has 8 poles in the stator and they have 5 teeth in each pole. If the rotor has 50 teeth, Calculate the Step angle and also Resolution.	C403.2	E
4	What is mid frequency response in stepper motor.	C403.2	A
5	Draw the Block diagram of Microprocessor based Closed loop system of Stepper Motor	C403.2	U
6	What are the two types of current control technique?	C403.3	R
7	What is meant by effectiveness in SRM?	C403.3	A
8	State the need for non-linear analysis of switched reluctance motor?	C403.3	A
9	What is the need for shaft position sensor for SRM?	C403.3	A
10	Clearly specify the function of controller circuit in SRM.	C403.3	A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the static and dynamic characteristics of a stepper motor.	C403.3	U
	Or		
12	Mention the power drive circuits for stepper motor and Explain any two in detail.	C403.3	R,U
13	Describe the construction, working principle of SRM with its advantages and applications.	C403.3	U
	Or		
14	Describe the hysteresis type and PWM type current regulator for one phase of a SRM.	C403.3	R

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the various modes of operation of SRM.	C403.3	R
	Or		
16	Explain the Microprocessor based control of SRM drive.	C403.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff In-Charge : Dr.S.Thamizharasan., Asso. Prof/EEE, Mr.T.Tamilarasan., /Asst. Prof./EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date	20.08.19	Marks	50
Course code	MG6851	Course Title	PRINCIPLES OF MANAGEMENT			
Batch No.		Duration	90 minutes	Academic Year	2019 - 2020	
Year	IV	Semester/Section	VII / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is a flat organisation?	C404.2	U&C
2	Planning premises – explain.	C404.2	U&C
3	What are programmed decisions?	C404.2	U&C
4	What is MBO?	C404.2	U&C
5	What do you mean by policy?	C404.2	U&C
6	What is organizing?	C404.3	U&C
7	What is proactive planning?	C404.3	U&C
8	What is organisation chart?	C404.3	U&C
9	What is staff authority?	C404.3	U&C
10	What is forecasting?	C404.3	U&C

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain formal and informal organisations. List some factors influencing span of control.	C404.2	U&C
	Or		
12	Explain the advantages of decentralization. What are the barriers to delegation of authority?	C404.2	U&C
13	What is recruitment? What are the sources of recruitment?	C404.3	U&C
	Or		
14	What is departmentation? Explain the various kinds of departmentation.	C404.3	U&C

Part – C

(Answer all the questions 1 x 10 = 10marks) Case study

Q. No.		CO	Skills
15	Assume you are posted as HR manager of an IT firm. How will you conduct the selection process of the company for the post of a Finance Manager?	C404.3	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/Session	17-08-19/FN	Marks	50
Course code	EE6702	Course Title	Protection and Switchgear			
Batch No.		Duration	90 mins	Academic Year		2019 - 2020
Year	IV	Semester/Section	VII / A & B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is biased differential beam relay?	C402.2	U
2	Define the term pilot with reference to power line protection.	C402.2	R
3	What are the purpose of PSM and TSM?	C402.2	U
4	Write the limitations of Merz Price protection.	C402.2	U
5	What are the uses and limitations of Buchholz relay?	C402.3	U
6	What are the problems in bus zone differential protection?	C402.3	U
7	What is REF relay?	C402.3	U
8	What is the general connection rule for Current transformers in differential protection?	C402.3	R
9	Can current transformers secondary winding be open circuited? Justify your answer.	C402.3	U
10	Write the coordination equation for inverse over-current relay?	C402.3	U

Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Classify different protection schemes normally used for protection of a power transformer from internal faults? Discuss one of them in brief. (10)	C402.3	U
	Or		
12	Show the protective scheme employed for the bus bar. (10)	C402.3	U
13	Describe the types of protective schemes employed for the protection of field winding and loss excitation of alternator. (10)	C402.3	U
	Or		
14	Explain the types of protective schemes employed for transmission line protection. (10)	C402.3	U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the working principles of following relays. i. Negative sequence relay (5) ii. Under frequency relay (5)	C402.2	U
	Or		
16	Explain the working of various differential relay with neat sketch. (10)	C402.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Incharge : Dr.C.Krishnakumar & Mr.P.K.Arun Kumar

Saranathan College of Engineering
Tiruchirapalli

Model Exam			Date/Session	09.10.19	Marks	100
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	3 Hrs.	Academic Year	2019 - 2020	
Year/	II	Semester/Section	IV/A&B	Department	EEE	

Part – A (Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	State Demorgan's theorem.	C201.1	R
2.	Write down the truth table of full subtractor.	C201.2	A
3.	Write the POS representation of the following: f(x,y,z)=∑m(0,1,3,5,7).	C201.2	U,A
4.	What is the difference between SR and JK-FF?	C201.3	U
5.	Convert T flipflop to D flipflop?	C201.3	A
6.	What is state assignment and explain its type?	C201.4	R,U
7.	Implement the following Boolean function using PROM F1(X,Y) = ∑m(2,3) F2(X,Y) = ∑m(0,1,2)	C201.4	R,U
8.	Define figure of merit	C201.4	R,A
9.	Write a VHDL program for XOR gate	C201.5	R
10.	Define Entity and syntax	C201.5	R

Part – B
(Answer all the questions 5 x 13= 65marks)

Q. No.	Questions	CO	Skills
11.a	A 12 bit Hamming code word is read from memory. What was the original 8 bit data word that was written into memory if the 12 bit word read out is as (1)101110010100 (2)111111110100	C201.1	E
	(Or)		
11.b	i. Perform the following addition using BCD and Excess-3 addition (205+569). ii. Encode the binary word 1011 into seven bit parity hamming code.	C201.1	E
12.a	Design a 4 bit excess 3 code to BCD converter and implement using logical gates.	C201.2	U,A
	(Or)		
12.b	Reduce the following function using K-map. f(A,B,C,D)=ΠM(0,2,3,8,9,12,13,15) Simplify the following function using Karnaugh map. f(w,x,y,z)=∑m(0,1,3,9,10,12,13,14)+∑d(2,5,6,11)	C201.2	A
13.a	Design Seven segment display decoder	C201.3	AZ
	(Or)		
13.b	A sequential circuit with 2D-FFs A and B and input X and output Y is specified by the following next state and output equations. A(t+1) = AX + BX ; B(t+1) = A'X; Y = (A+B)X' i. Draw the logic diagram of the circuit ii. Derive the state table iii. Derive the state diagram	C201.3	AZ
14.a	Design a two inputs (x1x2), two output z1,z2 fundamental mode circuit that has the following specifications. When x1x2=00, z1z2=00. The output 10 will be produced due to the following occurrence of the input sequence 00-01-11. The output will remain at 10 until the input returns to 00 at which time it becomes 00. An output of 01 will be produced following the receipt of input sequence 00-10-11, and once again, the output will remain at 01 until a 00 input occurs, which returns the output to 00.	C201.4	AZ

	(Or)		
14.b	**Design a PLA & PAL using AND and OR logic for the following functions.** **F1=∑m(0,1,2,3,4,7,8,11,12,15) F2=∑m(2,3,6,7,8,9,12,13)** **F3=∑m (1,3,7,8,11,12,15) F4=∑m (0,1,4,8,11,12,15)**	**C201.4**	**AZ**
15.a	**Write a short notes on i. RTL ii. UAT**	**C201.5**	**E**
	(Or)		
15.b	**Write a VHDL program for i. Full adder using 2 HA ii. Four bit Adder**	**C201.5**	**R**

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	**Design a pulse mode circuit with an inputs x1,x2, x3 and output. The output should change from 0 to 1, only for input sequence x1-x2-x3 occurs while z=0. Also the output z should remain in 1 until x2 occurs. Use T-ff for the design.**	**C201.4**	**A**
	(Or)		
16.b	**Write a VHDL program for i. Full adder using 2 HA ii. Four bit Adder using three types of modelling**	**C201.4**	**R**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty:
Dr.S. Vijayalakshmi, ASP/EEE, R.S. Priyaa Dharshini, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Model Exam			Date/ Session	09-10-19 / FN	Marks	100
Course code	EE8551	Course Title	Microprocessor and Microcontrollers			
Batch No.		Duration	3 hours	Academic Year	2019	
Year/	III	Semester/ Section	V / A&B	Department	EEE	

Part – A (Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	List the features of temporary registers.	C302.1	U
2	Define stack pointer	C302.1	R
3	Mention the purpose of SID and SOD lines.	C302.2	U
4	Differentiate CALL and JUMP instructions	C302.2	U
5	Explain different types of instructions available in 8051	C302.3	A
6	Explain the interrupts of 8051 microcontrollers.	C302.3	A
7	Draw the command word format of 8255 in I/O mode.	C302.4	R
8	Write the different modes of 8254	C302.4	A
9	Write a program to find 2's complement in 8051.	C302.6	AZ
10	Mention any four data transfer instructions of 8051 microcontrollers.	C302.6	A

Part – B (Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11	a) Explain with neat diagram , the pinout details of 8085 microprocessor	C303.1	R
	or		
	b) (i) Describe the interrupts of 8085 and its types with service routine	C303.1	R
	(ii) Draw the timing diagram of opcode fetch and machine cycle.	C303.1	AZ
12	a) With example, explain the different addressing modes of 8085 and different types of instruction format.	C303.2	R
	or		
	b) Write an assembly program to convert a hexadecimal number to ASCII code	C303.2	AZ
13	a) Briefly discuss the ports of 8051, internal circuits and its function in details	C303.3	R
	or		
	b) Discuss about the organization of internal RAM and special function registers of 8051 microcontroller in detail.	C303.3	U
14	a) Draw the block diagram of 8254 and Explain its various operating modes.	C303.4	U
	or		
	b) Explain the block diagram, architecture and registers of the 8259 keyboard/ display controllers.	C303.4	R
15	a) Explain how to control a servo motor using 8051 with neat interface diagram and assembly program.	C303.5	AZ
	or		
	b) Sketch the interface of a 5 X 7 LCD to the 8051 microcontroller. Write an 8051 assembly program segment to display 'YES'.	C303.5	AZ

Part – C (Answer all the questions 1 x 15 = 15 marks)

Q. No.	Questions	CO	Skills
16a	Sketch the interface of an ADC 808 to the 8051 microcontroller. Write an 8051 assembly program segment to read an analog signal through the ADC	C302.6	AZ
	OR		
16b	Design a microcontroller based system to control the washing machine and write a program for the same	C302.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Incharge: M.Marimuthu&S.RamPrasath,AP,EEE.

Saranathan College of Engineering
Tiruchirapalli

Model Examination			Date/ Session	1.10.2019 / FN	Marks	100
Course code	EE8552	Course Title	Power Electronics			
Batch No.		Duration	3 hrs	Academic Year	2019-2020	
Year/	III	Semester/ Section	V / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Define Holding Current and Latching current in SCR	C303.1	R
2	What are the advantages of GTO over SCR?	C303.1	R
3	What is meant by phase control?	C303.2	U
4	Why power factor of semiconverter is better that full converter?	C303.2	U
5	What is time ratio control in DC to DC converter?	C303.4	R
6	Define current limit control in DC to DC converter	C303.4	U
7	What are the advantages of PWM control in inverters?	C303.5	A
8	Compare VSI and CSI.	C303.5	U
9	What is the drawback of AC voltage controller as compared to Inverter.	C303.6	U
10	Enumerate some of the industrial applications of a cycloconverter.	C303.6	A

Part – B

(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11 a	Explain the structure and different modes of operation with characteristics of TRIAC	C303.1	U
	OR		
11 b	Draw and explain the TURN ON & OFF characteristics of SCR with neat sketch.	C303.1	U
12 a	Explain the operation of 3 phase fully controlled converter feeding RL Laod with complete circuit diagram and waveforms.	C303.3	U
	OR		
12 b	A 230V, 50Hz supply is connected to load resistance of 12ohms through half wave controlled rectifier. If the firing angle is 60 degree, determine, (i) Average output voltage (ii) RMS output voltage (iii) Ratio of rectification P_{dc}/P_{ac} and (iv) Transformer utilization factor	C303.3	A
13 a	Describe with basic circuit and waveform the principle of operation of step-up Chopper.	C303.4	R
	OR		
13 b	With neat sketch explain operation of Buck-boost converter with its wave for continuous current mode of operation.	C303.4	U
14 a	Discuss the functioning of three phase voltage source inverter in 120degree operating mode.	C303.5	U
	OR		
14 b	(i) Explain the working of series inverter with the aid of circuit diagram. (ii) Explain different PWM techniques in details.	C303.5	R
15 a	Describe the basic principle of working of 1Φ - 1Φ step down cycloconverter for a bridge type converter. Assume both discontinuous and continuous conduction and draw the load current and load voltage waveforms for both the cases. Spot out the	C303.6	U

	conduction of various thyristors		
	OR		
15 b	**Write short note on the following:** **(i) Integral cycle control (4)** **(ii) Multistate sequence control (5)** **(iii) Step up cycloconverter (4)**	**C303.6**	**R**

Part – C

(Answer all the questions 1 x 15 = 15 marks)

Q. No.	Questions	CO	Skills
16 a	**(i) Explain the control strategies of Chopper** **(ii) A step down DC chopper has input voltage of a 230V with 10 ohms load resistor connected. Voltage drop across the switch is 2V when it is turned ON. For a duty cycle of 0.5, calculate** **1. Average and RMS value of output voltage.** **2. Power delivered to load.**	**C303.4**	**AZ**
	OR		
16 b	**Explain the working of Boost converter in detail with necessary waveforms and equations.**	**C303.4**	**U**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Subject handling Faculty : R.Balasubramanian / Assoc Prof / EEE & S.Sivakumar / AP / EEE

Saranathan College of Engineering

Tiruchirapalli

Model Theory Examiniation			Date/ Session	03.10.2019/ FN	Marks	100
Course code	EE8591	**Course Title**	Digital Signal Processing			
Batch No.		**Duration**	3 hrs	**Academic Year**	2019 - 2020	
Year	III	**Semester/ Section**	V/A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define deterministic and random signals.	C304.1	R
2	Sketch x[n] = { 2,1,3,0,2} and find x[n+2],x[n-4].	C304.1	A
3	State the time reversal property of the z-transform.	C304.2	U
4	Determine the range of values of the parameter 'a' for which the linear time invariant system with impulse response $h(n)=a^n u(n)$ is stable.	C304.2	U
5	Calculate the number of multiplications required to calculate DFT and FFT of 64 point sequence.	C304.3	A
6	Determine the convolution sum of two sequences x(n) = {3,2,1,2} and h(n) = {1,2,1, 2}.	C304.3	A
7	Write the condition on the FIR sequence h(n) is to be imposed as a liner phase filter?	C304.4	U
8	Write a note on pre-warping method.	C304.4	U
9	List the advantages of VLIW Architecture	C304.6	U
10	List the on chip peripherals in C5x.	C304.6	R

Part – B

(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11 a	(i) Show that the power of a signal is equal to the sum of powers of its even and odd components (5) (ii) Prove the system is time invariant and stable, $y(n) = x(n^2)$ if $x(n) = 1, 0 \le n \le 3$. Illustrate y(n) and y(n-2), compare the results. (8)	C304.1	AZ
	or		
11 b	(i) Determine the energy and power of the signal, x[n]=nu[n] (5) (ii) What is meant by quantization and quantization error? A signal $x(t) = \sin c(50 \pi t)$ is sampled at a rate of (i) 20 Hz (ii) 50 Hz and (iii) 75 Hz. For each of these cases, explain if you can recover the signal x(t) from the sampled signal x(n). (8)	C304.1	AZ
12 a	(i) Determine the z-transform of the following signals, $x(n) = n.(-1)^n u(n)$ and $x(n) = -n.a^n. u(-n-1)$ (8) (i) Find the impulse response of the discrete time system described by the difference equation $y(n-2) - 3y(n-1) + 2y(n) = x(n-1)$ (5)	C304.2	AZ
	or		
12 b	(i) Determine all possible signals *x(n)* associated with the z-transform $X(z) = 5z^{-1} / (1- 2z^{-1})(3-z^{-1})$ (8) (ii) Determine the convolution of the signals using z transform $x_1(n) = n.u(n)$ and $x_2(n) = 2^n u(n-1)$ (5)	C304.2	AZ
13 a	An 8-point sequence is given by x(n) = {2,2,2,2,1,1,1,1} compute DFT by Radix-2 DIF-FFT	C304.3	AZ
	or		
13 b	Find the IDFT of the sequence X(k)={4, 1-j2.414, 0, 1-j0.414, 0, 1+j0.414, 0, 1+j2.414}	C304.3	AZ

14 a	Design a Chebyshev digital filter for the following specifications $0.8 \leq \lvert H(e^{j\omega})\rvert \leq 1$ for $0 \leq \omega \leq 0.2\pi$ and $\lvert H(e^{j\omega})\rvert \leq 0.2$ for $\omega \geq 0.6\pi$ using Bilinear technique with T = 1 sec	C304.5	AZ
	or		
14 b	Design a filter using Fourier series method for N=9 of Band Reject Filter. $H_d(e^{j\omega}) = \begin{cases} 1\ for\ \lvert\omega\rvert \leq \frac{\pi}{6} \\ 0\ for\ \frac{\pi}{6} \leq \lvert\omega\rvert \leq \frac{\pi}{3} \\ 1\ for\ \lvert\omega\rvert \geq \frac{\pi}{3} \end{cases}$	C304.4	AZ
15 a	Explain various types of addressing modes of Digital signal Processors with suitable examples	C304.6	AZ
	or		
15 b	Explain the following (i) MAC unit of DSP (ii) Pipelining structure of DSP	C304.6	AZ
	Part – C **(Answer all the questions 1 x 15 = 15 marks)**		
16 a	Design a filter using Hamming Window with N = 7 of the system, $H_d(e^{j\omega}) = \begin{cases} e^{j3\omega},\ \frac{-\pi}{4} \leq \omega \leq \frac{\pi}{4} \\ 0, otherwise \end{cases}$	C304.4	AZ
	or		
16 b	(i) A difference equation describing a filter given by, y(n) – 2y (n-1) + y (n-2) = x(n) + 0.5 x (n-1) obtain cascaded structure. (5) (ii) Detrmine the transfer function of the Butterworth filter for α_P = 3dB, α_S = 16dB, f_P = 1kHz and f_S = 2 kHz. (8)	C304.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.P.Ram Prakash, AP/EEE, Ms.A.R.Danila Shirly, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Model Examination			Date/ Session	01.10.2019/ FN	Marks	100
Course code	EC8353	Course Title	Electron Devices And Circuits			
Batch No.		Duration	3 hours	Academic Year	2019 - 2020	
Year/	II	Semester/ Section	III	Department	EEE	

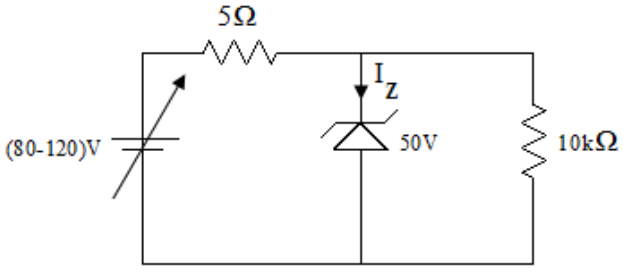
Part – A

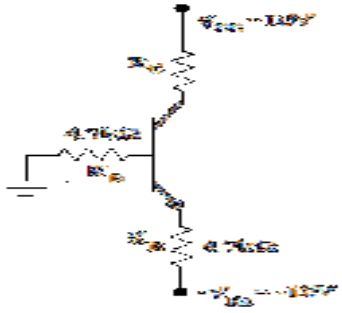
(Answer all the questions 10 x 2 = 20 Marks)

Q. No.	Questions	CO	Skills
1	An ac voltage of peak value 20V is connected in series with a silicon diode and load resistance of 500Ω. If the forward resistance of diode is 10Ω. Find the peak current through diode.	C205.1	U
2	State two disadvantages of half wave rectifier.	C205.1	R
3	Show how SCR can be triggered on by the application of a pulse to the gate terminal.	C205.2	R
4	What is latching current?	C205.2	R
5	In a common base configuration, current amplification factor is 0.9. If the emitter current is 1mA. Find the value of base current.	C205.3	R
6	State the phase relationships between input/output currents and phase relationships between input/output voltages of various transistor configurations.	C205.3	R
7	A multistage amplifier employs five stages of which have a power gain of 30. What is the total gain of amplifier in db?	C205.4	E
8	Define differential mode signals of a differential amplifier.	C205.4	U
9	Differentiate positive and negative feedback.	C205.5	U
10	State Barkhausen's criterion for sustained oscillation in an oscillator.	C205.6	R

Part – B

(Answer all the questions 5 x 13 = 65 Marks)

Q. No.	Questions	CO	Skills
11. (a).(i)	Explain the working of Zener diode as voltage regulator. (7)	C205.1	U
(ii)	For the following circuit, find the maximum and minimum values of zener diode current. (6) 	C205.1	U&AZ
	Or		
(b)	Explain the working of full wave bridge rectifier and derive the expression for ripple factor, voltage, current, efficiency, PIV and transformer utilization factor	C205.1	R &U
12. (a) (i)	Explain about voltage divider bias method for biasing of transistor. (7)	C205.2	R &U

	Find the Q point of the transistor shown below. Also draw the dc load line. Give β= 100 and V_{BE}= 0.7V, R_c= 1KΩ. (6) 	C205.2	R,U &AZ
	Or		
(b)	With neat diagram, explain the working of enhancement MOSFET and depletion MOSFET. Explain drain and transfer characteristics.	C205.2	R,U&AZ
13. (a)	Draw the h-parameter model of CE amplifier and derive its voltage gain, input and output impedance.	C205.3	R,U&AZ
	Or		
(b)	Draw the circuit diagram of a common drain MOSFET amplifier. Derive the expression for its voltage gain, input resistance and output resistance.	C205.3	R,U&AZ
14.(a) (i)	Explain briefly about working of BJT emitter coupled differential amplifier. (5)	C205.4	R&U
(ii)	Derive the expression for common mode and differential mode gain of differential amplifier. (8)	C205.4	R&U
	Or		
(b)	What is neutralization? Explain any two methods of neutralization techniques with necessary circuit diagram.	C205.4	R&U
15. (a)	Draw the frequency response of an ideal and practical tuned amplifier and discuss their characteristics	C205.4	R&U
(b) (i)	Compare voltage and power amplifiers (6)	C205.4	R,U&AZ
(ii)	Discuss the advantages and disadvantages of any three classes of power amplifiers. (7)	C205.4	R,U&AZ

Part – C (Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16. (a).	With neat circuit diagram, explain the operation of Hartley oscillator and derive the expression for frequency of oscillation.	C205.6	R &U
	Or		
(b)	Explain the working of phase shift oscillator. Discuss the advantages and disadvantages.	C205.6	U &E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Course handling faculties
Dr. S. Thamizharasan Asso.Prof/ EEE
Mr. R. Sridharl AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Model Examination			Date/ Session	12-10-2019/ FN	Marks	100
Course code	EE8301	Course Title	Electrical Machines - I			
Batch No.		Duration	3 Hours	Academic Year	2019-2020	
Year	II	Semester/ Section	III/A&B	Department	EEE	

Part – A(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Define magneto-motive force.	C204.1	R
2	Calculate the inductance and energy stored in the magnetic field of an air cored solenoid 60cm long, 5cm in diameter and wound with 500 turns, carrying a current of 10A.	C204.1	E
3	What is meant by Scott connection of transformers?	C204.2	U
4	What are the advantages of using tertiary winding in transformer?	C204.3	R
5	What is meant by rotating MMF?	C204.4	R
6	What are the different types of leakage flux in rotating Machines?	C204.4	R
7	What are effects of armature reaction in DC machine?	C204.5	R
8	Define critical field resistance and critical speed of DC generator.	C204.5	
9	What is the necessity of starter in DC motor?	C204.6	U
10	Mention the applications of DC shunt and DC series motor.	C204.6	U

Part – B(Answer all the questions 5 x 13 = 65 marks)

<table>
<tr><th>Q. No.</th><th>Questions</th><th>CO</th><th>Skills</th></tr>
<tr><td>11(a)</td><td>Write short note on following (i) statically induced emf (ii) dynamically induced emf(iii) Hysteresis loss (iv) eddy current loss</td><td>C204.1</td><td>U</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td>11(b)</td><td>With neat diagram explain in detail about transformer as a magnetic coupled circuit.</td><td>C204.1</td><td>U</td></tr>
<tr><td rowspan="4">12(a)</td><td colspan="2">(i) Tests are performed on 1Φ ,10kVA, 2200/220V, 60 Hz transformer and the following results are obtained</td><td rowspan="4">C204.2&3</td><td rowspan="4">E&U</td></tr>
<tr><td>Meter’s reading</td><td>O.C Test
(H.V side Open)</td><td>S.C Test
(L.V side Short circuited)</td></tr>
<tr><td>Voltmeter
Ammeter
Wattmeter</td><td>220 V
2.5A
100 W</td><td>150V
4.55A
215W</td></tr>
<tr><td colspan="2">Determine the parameters for approximate equivalent circuit referred to LV side.(8)
(ii) Write a short note on phasing of transformer.(5)</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td>12(b)</td><td colspan="2">(i) Write short note on per unit representation of transformer.(5)

(ii)Deduce the expression for Volume of copper saved in terms of turns ratio when compared with a 2- winding transformer (8)</td><td>C204.2&3</td><td>U</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td>13(a)</td><td colspan="2">Derive an expression for force and torque in multiply excited system for linear and non linear case.</td><td>C204.4</td><td>E</td></tr>
<tr><td></td><td colspan="2">OR</td><td></td><td></td></tr>
</table>

13(b)	Two coupled coils have self and mutual inductance of $L_{11} = 2 + \frac{1}{2x}$; $L_{22} = 1 + \frac{1}{2x}$; $L_{12} = L_{21} = \frac{1}{2x}$ over a certain range of linear displacement *x*, The first coil is excited by a constant current of 20A and second by a constant current of -10 A. Find: (a) Mechanical work done if *x* changes from 0.5 to 1m (b) Energy supplied by each electrical source in Part (a) (c) change in field energy in Part(a). Hence verify that the energy supplied by the sources is equal to the increase in the field energy plus the mechanical work done	C204.4	E
14(a)	(i) Derive an emf equation of DC generator(6) (ii)A 6 pole lap wound d.c generator has 600 conductors on its armature. The flux per pole is 0.02 wb. Calculate (i) the speed at which the generator must be run to generate 300V (ii) what would be the speed if the generator were wave wound?(7)	C204.5	U&E
	OR		
14(b)	(i) Draw and explain the characteristics of DC shunt generator(6) (ii) A 250 kW, 400 V, 6-pole dc generator has 720 lap wound conductors. It is given a brush lead of 2.5 angular degrees (mech). from the geometric neutral. Calculate the cross and demagnetizing turns per pole. Neglect the shunt field current.(7)	C204.5	U&E
15(a)	(i) Derive an expression for torque equation of DC motor.(6) (ii) A 4-pole dc motor is lap-wound with 400 conductors. The pole shoe is 20 cm long and average flux density over one-pole-pitch is 0.4 T, the armature diameter being 30 cm. Find the torque and gross mechanical power developed when the motor is drawing 25 A and running at 1500 rpm.(7)	C204.6	U&E
	OR		
15(b)	(i) With neat diagram Explain the working principle of 4 point starter(7) (ii) Write short note on plugging, dynamic braking and regenerative braking of DC shunt motor(6)	C204.6	U&E

Part – C
(Answer all the questions 1 x 15= 15 marks)

<table>
<tr><th>Q. No.</th><th>Questions</th><th>CO</th><th>Skills</th></tr>
<tr><td rowspan="5">16(a)</td><td>Two single phase transformers which have the same turns ratio are connected in parallel and supply a total load of 800kW at 0.8 p.f lagging. Their ratings are as follows;
<table>
<tr><th>Transformer</th><th>Rating</th><th>p.u resistance</th><th>p.u. reactance</th></tr>
<tr><td>A</td><td>400kVA</td><td>0.02</td><td>0.04</td></tr>
<tr><td>B</td><td>600kVA</td><td>0.01</td><td>0.05</td></tr>
</table>
Determine the power output and the power factor of each transformer.</td><td rowspan="5">C204.3</td><td rowspan="5">E</td></tr>
<tr><td colspan="2">OR</td></tr>
<tr><td>16(b)</td><td>A 10 kW, 250 V, dc shunt motor with an armature resistance of 0.8 W and a field resistance of 275 ohms takes 3.91 A, when running light at rated voltage and rated speed.
(a) What conclusions can you draw from the above data regarding machine losses?
(b) Calculate the machine efficiency as a generator when delivering an output of 10 kW at rated voltage and speed and as a motor drawing an input of 10 kW. What assumption if any do you have to make in this computation?
(c) Determine the maximum efficiencies of the machine when generating and when motoring.</td></tr>
</table>

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty : P. Ramesh Babu (AP/EEE) & R. Balasubramanian(Asso.Prof/EEE)

Saranathan College of Engineering
Tiruchirapalli

MODEL EXAM			Date/Session	05.10.19	Marks	100
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	3 HOURS	Academic Year	2019 – 2020	
Year	II	Semester/Section	III/ A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What are the sources and effects of electromagnetic fields?	C203.1	R
2.	A= 25r sin Φ. Determine the gradient of A at point P ($\sqrt{2}, \frac{\pi}{2}$, 5) defined in cylindrical co-ordinate system.	C203.1	AZ
3.	Define electric potential and potential difference.	C203.3	U
4.	Write the equation for capacitance of coaxial cable.	C203.3	AZ
5.	An infinite long straight filament carrying a current of 3A is located along z-axis. Calculate the magnetic field intensity and magnetic flux density at point (1, 2, 1).	C203.4	AZ
6.	A current of 3A flowing through an inductor of 100mH. What is the energy stored in the inductor?	C203.4	AZ
7.	Write the expression for the torque experienced by a current carrying loop placed in the magnetic field.	C203.4	U
8.	Define Brewster angle.	C203.6	A
9.	Define standing wave ratio.	C203.6	A
10.	Write down the values of $\alpha,,\gamma$, velocity and intrinsic impedance for free space.	C203.6	R

Part – B

(Answer all the questions 5 x 13 = 65marks)

Q. No.	Questions	CO	Skills
11 a)	(i)Write short notes on (i) gradient (ii) curl (iii) divergence (iv) divergence theorem with its physical significance. (8) (ii) State and prove Guass law. (5)	C203.1	R
	Or		
11 b)	(i)Derive an expression for Electric Field Intensity at a point due circular disc.(8) (ii)Transform $4\vec{a_x}$ -$2\vec{a_y}$-$4\vec{a_z}$ at (2,3,5) to cylindrical co-ordinates.(5)	C203.1	AZ
12 a)	(i)Derive an expression for potential (V) and electric field intensity ($\vec{E}$) due to an Electric Dipole. (8) (ii)A circular disc of radius 'a'm is charged uniformly with a charge density of σ_s C/m^2. Find the electric potential at a point P, distant 'h' m from the disc surface along its axis. (5)	C203.3	U
	Or		
12 b)	(i)Derive the boundary conditions of the normal and tangential components of electric field at the interface of two media with different dielectrics.(7) (ii)Derive an expression for capacitance of concentric spheres using Laplace equation.(6)	C203.3	R
13 a)	(i) Derive the expression for magnetic flux density and magnetic field intensity due to an infinitely long conductor. (10) (ii) An infinite long straight filament carrying a current of 3A is located along z-axis. Calculate the magnetic field intensity and magnetic flux density at point (1, 2, 1).(3)	C203.4	R
	Or		

13 b)	**(i) For a finite current sheet of uniform current density 'k' A/m, Derive the expression for the magnetic field intensity.(6)** **(ii) Derive the expressions for inductance due to solenoid and toroidal coil. (4+3)**	**C203.4**	**AZ**
14 a)	**(i) Derive the expressions for boundary conditions in magnetic fields. (8)** **(ii) Determine the torque on a rectangular loop carrying current I and placed in a uniform magnetic field.(5)**	**C203.5**	**A**
	Or		
14 b)	**With necessary explanation, derive the Maxwell's equation in differential and integral forms for Time varying fields & Time harmonic fields.**	**C203.5**	**R**
15 a)	**Derive the equation for plane waves in** **(i) Free space.** **(ii) Homogeneous material (perfect dielectrics).** **(iii) Conducting medium.**	**C203.6**	**R**
	Or		
15 b)	**(i)Briefly explain about the wave incident** **(a) Normally on perfect conductor** **(b) obliquely to the surface of perfect conductor (8)** **(ii)A plane wave travelling in + direction in free space (z <0) is normally incident at z =0 on a conductor (z <0) for which σ = 61.7 MS/m, μ_r = 1. The free space E wave has a frequency f = 1.5 MH z and an amplitude of 1.0 V/m at the interface it is given by $\vec{E}$ (0,t)= 1.0 sin 2πft $\vec{a_y}$ V/m . Analyse the wave and predict magnetic wave $\vec{H}$ (0,t) at z >0 . (5)**	**C203.6**	**AZ**

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16 a)	**A particular vector field $\vec{D}$ = $r^2\cos^2\phi\,\vec{a_r}$ +$z\sin\phi\vec{a_\phi}$ is in cylindrical system. Find the flux emanating due to this field from the closed surface of the cylinder 0≤ z ≤ 1, r=4. Verify divergence theorem.**	**C203.1**	**AZ**
	Or		
16 b)	**A uniform plane wave in a medium having σ = 10^{-3} S/m, ε= ε_0 , μ_r = 1, is having a frequency of 10KHz.** **i) Verify whether the medium is good conductor** **ii) Calculate the following,** **1) Attenuation constant** **2) Phase constant** **3) Propagation constant** **4) Intrinsic impedance** **5) Wave length** **6) Velocity of propagation**	**C203.1**	**AZ**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Name of the faculty: N.Vijayasarathi & N.Gayathri

Saranathan College of Engineering
Tiruchirapalli

Model Exam			Date/Session	01.10.19/FN	Marks	100
Course code	EE8353	Course Title	ELECTRICAL DRIVES AND CONTROL			
Batch No.		Duration	3 hours	Academic Year	2019-2020	
Year	II	Semester/Section	III/A&B	Department	MECH	

Part – A(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Name the basic elements of Electric Drives.	205.1	R
2	What is heating and cooling time constant?	205.1	U
3	Why series motor never started on no load?	205.2	AZ
4	List the types of single phase induction motors.	205.2	R
5	What is the drawback of 3 point starter?	205.3	R
6	List the types of starter suitable for three phase squirrel cage induction motor.	205.3	R
7	Define duty cycle in DC chopper.	205.4	R
8	Differentiate between the armature and flux speed control methods.	205.4	A
9	List the various speed control methods used in AC motors.	205.5	R
10	Write the speed equation of 3 phase induction motor interms of slip.	205.5	R

Part – B(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11 a.	Explain various classes of motor duties.	205.1	U
	or		
11. b.	Explain heating and cooling curves of motor and obtain expression for maximum temperature attained.	205.1	U
12.a.	Explain in details about any two methods of braking in DC machines.	205.2	U
	or		
12.b	Explain the braking in induction motor with its torque– slip characteristics.	205.2	U
13.a	Explain the construction and working of 4-point starters with neat sketch.	205.3	A
	or		
13.b	Explain the types of starters which are used for 3 phase induction motor.	205.3	A
14.a	Describe about the armature and field control methods applied to DC motor.	205.4	A
	Or		
14.b	i) A 220V DC shunt motor having a field flux of 0.8 Wb, runs at a speed of 900 rpm. Find the speed of the motor, if the field flux reduced to 0.6 Wb by field resistance control method. (8) ii) List out the methods of speed control in DC motors.(5)	205.4	A
15.a	Explain the conventional methods of slip power recovery scheme.	205.5	A
	Or		
15.b	Explain the static scherbius drive which provides speeds below and above synchronous speed.	205.5	A

Part – C(Answer all the questions 1 x 15 = 15 marks)

16.a	Examine the operation of single phase full converter fed separately excited DC motor drive.	205.4	A
	Or		
16.b	A Series motor runs at 1000 rpm when the load current is 12A. The series field resistance is 0.8 ohm and armature resistance is 1 ohm. The series field coils are now regrouped from all in series to two in series with two parallel paths. The line current is now 20A. If the corresponding weakening of field is 15%, calculate the speed of the motor. Series motor has 4 poles and rated for 230V.	205.4	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Saranathan College of Engineering

Tiruchirapalli

MODEL EXAM			Date	10.10.2019	Marks	100
Course code	ME8792	Course Title	POWER PLANT ENGINEERING			
Batch No.		Duration	3hrs	Academic Year	2019 - 2020	
Year/	II	Semester/Section	III / A&B	Department	EEE	

Part – A (Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Describe the processes of Rankine Cycle.	C206.1	R
2	Define superheated steam	C206.1	AZ
3	Summarize the processes of diesel cycle.	C206.2	R
4	Name the components of Gas Turbine power plants.	C206.2	U
5	Describe the advantages of nuclear power plant.	C206.3	U
6	Explain the functions of moderators.	C206.3	R
7	Discuss the binding energy	C206.4	U
8	Explain fuel cell and state its advantages.	C206.4	R
9	How to improve the power factor.	C206.5	A
10	Define load factor and capacity factor.	C206.5	R

Part – B (Answer all the questions 5 x 13 = 65marks)

Q. No.	Questions	CO	Skills
11.a.	Describe the following subsystems of thermal power plant (i) Fuel handling system (ii) Ash handling system	C206.1	U
	Or		
11.b.	i) Describe the working of FBC boiler with a neat diagram. ii) Super critical Boiler.	C206.1	AZ
12.a.	Explain the essential components of the diesel power plant with neat diagram.	C206.2	AZ
	Or		
12.b.	Explain in detail about the construction and working of Integrated Gasifier based Combined cycle system(IGCC)	C206.2	U
13.a.	Compare the working merits and demerits of PWR and BWR	C206.3	U
	Or		
13.b.	i) Explain the Gas Cooled and Liquid Metal Cooled Reactors. ii) Explain the CANADA Deuterium- Uranium reactor (CANDU).	C206.3	U
14.a.	Generalize the construction and working of Geo thermal power plant	C206.4	U
	Or		
14.b.	(i) Explain with a neat diagram of wind electric generating power plant. (ii) Explain in detail about the various types of Wind energy system	C206.4	U
15.a.	Discuss the cost of electrical generation? What are the various types of cost associated with power generation?	C206.5	U
	Or		
15.b	i) Summarize short notes on site selection criteria. ii) Explain its merits and demerits	C206.5	U

Part – C (Answer all the questions 1 x 15 = 15marks)

16.a.	Explain with a neat sketch working of a Distributed (parabolic) through solar power plant	C206.4	A
	Or		
16.b	The peak load on a thermal power plant is 75MW. The loads having maximum demands of 35MW, 20 MW, 15 MW and 18 MW are connected to the power plant. The capacity of the power plant is 90 MW and the annual load factor is 0.53. Calculate the: a) Average load on the power plant. b) Energy Supplied per year. c) Demand factor. d) Diversity factor	C206.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

MODEL EXAM			Date	10.10.2019	Marks	100
Course code	OMD 551	Course Title	BASICS OF BIOMEDICAL ENGINEERING			
Batch No.		Duration	3hrs	Academic Year	2019 - 2020	
Year/	III	Semester/Section	V / A&B	Department	EEE	

Part – A (Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is bioelectric potential?	C306.1	R
2	Differentiate action potential and resting potential.	C306.1	AZ
3	Give the frequency range & amplitude of ECG, EEG and EMG waves.	C306.2	R
4	Draw EINTHOVEN TRIANGLE and how it is used in ECG measurement.	C306.2	U
5	What is the need for bio amplifier?	C306.3	U
6	Write short note on isolation amplifier	C306.3	R
7	Define cardiac output.	C306.4	U
8	What is the use of blood flow meter?	C306.4	R
9	Differentiate calorimeter from spectrophotometer	C306.5	A
10	What is the need of blood cell counter?	C306.5	R

Part – B (Answer all the questions 5 x 13 = 65marks)

Q. No.	Questions	CO	Skills
11.a.	Discuss the problems with the recording instruments for bio electric signal	C306.1	U
	Or		
11.b.	List the different types of electrodes and discuss in detail about any two electrodes	C306.1	AZ
12.a.	Describe the bio signal characteristics and list the frequency and amplitude ranges	C306.2	AZ
	Or		
12.b.	Explain in detail the working of unipolar, bipolar and average mode for EEG Measurement	C306.2	U
13.a.	Explain the need for bio amplifier and discuss in detail the working of differential bio amplifier with neat sketch.	C306.3	U
	Or		
13.b.	Discuss in detail power line interference and band passing filter.	C306.3	U
14.a.	Write brief note on respiration rate and pulse rate measurement.	C306.4	U
	Or		
14.b.	Describe in detail with neat diagram, differential ausculatory technique of blood pressure measurement.	C306.4	U
15.a.	Explain with the help of functional diagram the working of spectrophotometer and colorimeter.	C306.5	U
	Or		
15.b.	Explain the working of blood cell counter with the various methods of blood cell counter	C306.5	U

Part – C (Answer all the questions 1 x 15 = 15marks)

16.a.	Explain detail the various methods to measure cardiac output	C306.4	A
	Or		
16.b.	Describe in detail blood gas analyser with neat diagram and also write short notes on non-invasive patient monitoring.	C306.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Model Examination			Date/ Session	12.10.19/FN	Marks	100
Course code	EE8501	Course Title	Power System Analysis			
Batch No.		Duration	3 Hrs	Academic Year	2019-2020	
Year	III	Semester/ Section	V / A & B	Department	EEE	

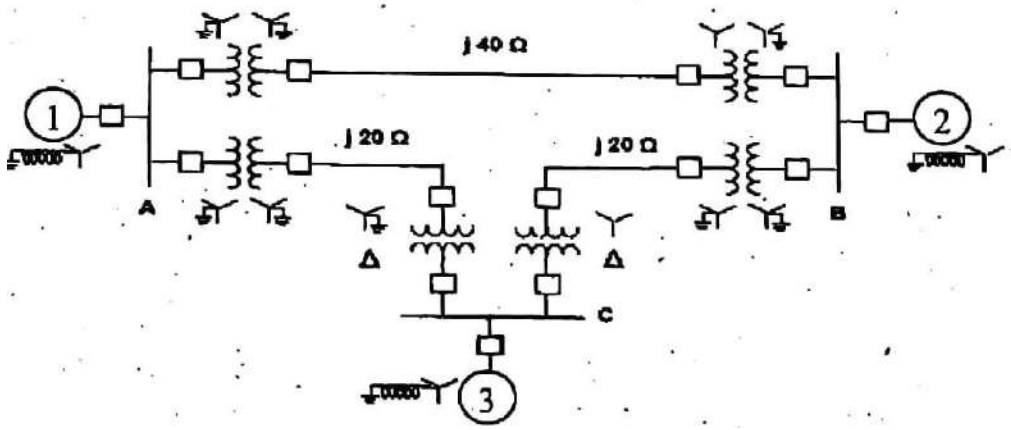
Part – A

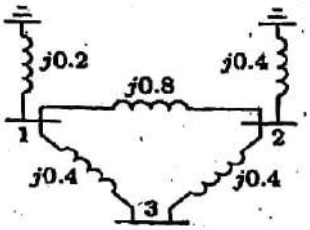
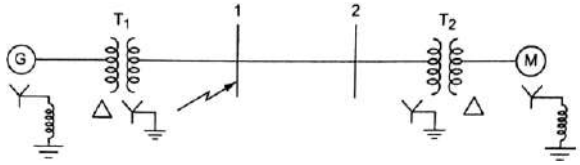
(Answer all the questions 10 x 2 = 20marks)

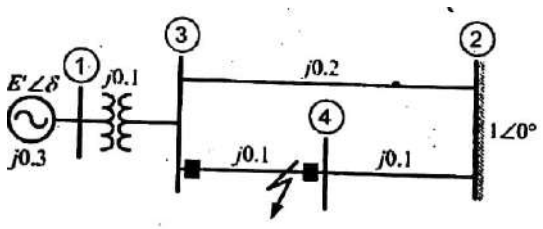
Q.No	Questions	CO	Skills
1.	What are the approximations made in impedance diagram?	C301.1	R
2.	A Y connected generator rated at 300MVA, 33KV has a reactance of 1.24p.u. Find the ohmic value of the reactance.	C301.1	E
3.	Why slack bus is used as an reference bus?	C301.2	U
4.	What is jacobian matrix?	C301.2	U
5.	What are all the assumptions to be made to simplify the short circuit study?	C301.3	R
6.	What is the significance of transient and subtransient reactance in short circuit studies?	C301.3	U
7.	Express the unbalanced voltages in terms of symmetrical components.	C301.4	U
8.	Define negative and zero sequence components.	C301.4	R
9.	State Equal Area criterion.	C301.5	R
10.	Hoe to improve the transient stability limit in the power system?	C301.6	U

Part – B

(Answer all the questions 5 x 13 = 65 Marks)

Q.No	Questions	CO	Skills
11. a)	Draw the impedance diagram of the power system shown below.  Mark impedances in per unit. Neglect the resistance and use a base of 50MVA, 138KV in the 40Ω line. The rating s of the generator , motors and transformers are :Generator 1 & 2 : 20MVA, 18kV, X"=20% Synchronous Motor: 3.3MVA, 13.kKV, X"=20% Three phase Y-Y transformers : 20MVA, 138Y/20Y kV; X=10% Three phase Y-Δ transformers : 15MVA, 138Y/13.8Δ kV,X=10%	C301.1	AZ & E
	OR		
b)	The parameters of a $-bus system are the following. Draw the network diagram and compute the bus admittance matrix.	C301.1	E

		Line No.	Line starting bus	Line ending bus	Line impedance(pu)	Line Charging Admittance(pu)		
		1	1	2	0.2+j0.8	j0.02		
		2	2	3	0.3+j0.9	j0.03		
		3	2	4	0.25+j1.0	j0.04		
		4	3	4	0.2+j0.8	j0.02		
		5	1	3	0.1+j0.4	j0.01		
12. a)	With a neat flow chart explain the computational procedure, for load flow solution using Gauss-Seidal method when the system contains all types of busses.						C301.2	UR
	OR							
b)	i) Develop a power flow equation at any bus in a power system. (06) ii) Evaluate the Jacobian elements for NR load flow. (07)						C301.2	UR
13. a)	Find Z_{Bus} using bus building algorithm for the given power system network.  						C301.3	AZ & E
	OR							
b)	A generator is connected through a five cycle CB to a transformer , is rated at 100MVA, 18KV with reactance's X_d'' =20% , X_d'=25% and X_d=110%. It is operated on no-load and at rated voltage. When a 3-phase fault occurs between the breaker and the transformer, find a) short circuit current in the breaker b) initial symmetrical rms current in the circuit breaker c) maximum possible DC component of the short circuit current in the breaker d) current to be interrupted by the breaker e) interrupting MVA.						C301.3	AZ & E
14. a)	Derive the expression for the fault current when double line to ground fault occurs in an unloaded generator.						C301.4	UR
	OR							
b)	A single line to ground fault occurs on bus 1 of the system as shown below.  Find i) current in the fault. ii) Short circuit current on the transmission line in all the three phases iii) Voltage of the healthy phase of bus 1. Given values: Rating of each machine 1200KVA, 600V with $X_1 = X_2 = 10\%$ and $X_o = 5\%$. Each three transformers are rated 1200KVA, 600V/3300V (Δ/Y) with leakage reactance of 5%. The reactance of the transmission line are $X_1=X_2=20\%$ and $X_o=40\%$ on the base of 1200KVA, 3300V. The reactance of neutral grounding reactors are 5% on the KVA and the voltage base of the machine.						C301.4	AZ & E
15. a)	Discuss the solution for swing equation by Euler and RK method.						C301.5	UR
	OR							
b)	The per unit system reactances that are converted in the common base are shown in fig.. Let us assume that the infinite bus voltage is $1\angle 0^o$. The generator is delivering 1.0 p.u real power at a lagging power factor of 0.9839 to the infinite bus. While the generator is operating at the steady state, the three-phase bolted short circuit occurs in the transmission line connecting between							

	busses 2 and 4. The fault is cleared by opening the circuit breakers at the two ends of this line. Find the critical clearing angle and clearing time if H=5MJ/MVA.  	C301.6	AZ &

Part – C

(Answer all the questions 1 x 15 = 15 Marks)

Q.No	Questions	CO	Skills
16. a)	Write the swing equation describing the rotor dynamics of a synchronous machine connected to the infinite bus through the double circuit transmission line.	C301.5	AZ
	OR		
b)	i) Describe the equal area criterion for transient stability of a power system. (6) ii) Derive the expression for critical clearing angle and critical clearing time for transient stability of a power system. (10)	C301.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Members: Dr. M.V.Suganyadevi, ASP/EEE; Mr.R.Sridhar, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

MODEL EXAMINATION			Date/ Session	05.10.2019/FN	Marks	100
Course code	EE6005	Course Title	POWER QUALITY			
Batch No.		Duration	3 Hours	Academic Year		2019 - 2020
Year/	IV	Semester/ Section	VII / A&B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define Voltage sag.	C405E4.1	R
2.	What is voltage imbalance in power quality?	C405E4.1	U
3.	What are the causes of voltage sag?	C405E4.2	R
4.	What are the mitigation techniques used for voltage sag compensation?	C405E4.2	R
5.	Define ferro resonance.	C405E4.3	U
6.	How to model a surge arrestor in PSCAD?	C405E4.3	A
7.	Differentiate between harmonics and transients.	C405E4.4	A
8.	Give atleast two IEEE standards for Harmonics.	C405E4.4	R
9.	What are the steps involved in power quality monitoring?	C405E4.5	R
10.	List some of the major power quality monitoring equipments.	C405E4.5	R

Part – B

(Answer all the questions 5 x 13 = 65marks)

Q.No.	Questions	CO	Skills
11.a	Discuss the following characteristics of power quality issues. i. Short duration variations (4) ii. Long duration variations (4) iii. Impulsive and oscillatory transients (5)	C405E4.1	U
	OR		
11.b	Draw and explain the CBEMA curve in determining power quality	C405E4.1	U, A
12.a	Illustrate the performance for estimating voltage sag performance.	C405E4.2	U
	OR		
12.b	Explain the role of active series compensators and static transfer switches in mitigation of voltage sags with neat diagram	C405E4.2	U, A
13.a	Discuss the various sources of over voltages the produce power quality problem.	C405E4.3	U
	OR		
13.b	Discuss the different methods of protection of transformers and cables against voltage transients.	C405E4.3	U, A
14.a	Describe the harmonic sources from commercial and industrial loads in detail.	C405E4.4	U
	OR		
14.b	Briefly discuss about the devices for controlling harmonic distortion that occur in power system.	C405E4.4	U
15.a	Describe briefly the various power quality monitoring considerations to be adopted in power quality problems.	C405E4.5	U, A
	OR		
15.b	Explain in detail with necessary diagram the working principle and functioning of harmonic analyzer.	C405E4.5	U

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	**Write short notes on** **i. DC offset** **ii. Harmonics** **iii. Inter Harmonics** **iv. Notching** **v. Noise**	C405E4.4	U
	OR		
16.b	**Explain the working principle and functioning of Flicker meter with its functional block diagram.**	C405E4.5	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In-charge: Ms.C.Pearline Kamalini & Mr.T.Tamilasaran

Saranathan College of Engineering
Tiruchirapalli

MODEL EXAMINATION			Date/ Session	03.10.2019/FN	Marks	100
Course code	EE6703	Course Title	SPECIAL ELECTRICAL MACHINES			
Batch No.		Duration	3 Hours	Academic Year		2018 - 2019
Year/	IV	Semester/ Section	VII / A&B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Mention some applications of synchronous reluctance motor.	C403.1	R
2.	Compare SyRM and induction motor.	C403.1	A
3.	Draw the block diagram of driving system of stepper motor.	C403.2	U
4.	State some applications of stepper motor.	C403.2	A
5.	State the principle of SRM.	C403.3	U
6.	What are the types of controllers used for SRM?	C403.3	R
7.	What are advantages of brushless DC motor drives?	C403.4	R
8.	List the permanent magnet materials used in PMBLDC motors.	C403.4	R
9.	What are the types of PMSM?	C403.5	R
10.	Why PMSM operated in self-controlled mode known as commutator less DC motor?	C403.5	A

Part – B

(Answer all the questions 5 x 13 = 65marks)

Q. No.	Questions	CO	Skills
11.a	Explain the construction and working principle of synchronous reluctance motor and mention its applications.	C403.1	U
	OR		
11.b	i. Draw the steady state phasor diagram of SyRM. (6) ii. Draw and explain the speed torque characteristics of SyRM. (7)	C403.1	U, A
12.a	Explain the operating principles, constructional features of three different types of stepper motor.	C403.2	U
	OR		
12.b	Explain the various modes of excitation of PM stepper motor with a bridge driver scheme.	C403.2	U, A
13.a	Describe the various power controller circuits applicable to SRM and explain the operation of any one scheme with suitable circuit diagram.	C403.3	U
	OR		
13.b	Explain the operation of C-Dump converter used for the control of SRM.	C403.3	U
14.a	Derive the expression for emf and torque equation of PMBLDC motor.	C403.4	AZ
	OR		
14.b	Describe the operation of power controllers for PMBLDC motor with neat diagram.	C403.4	U
15.a	Enumerate the design considerations of PMSM.	C403.5	U, A
	OR		
15.b	With necessary phasor diagram and circle diagram, describe the speed torque characteristics of PMSM.	C403.5	AZ

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	**A brushless PM sine wave motor has an open circuit voltage of 173V at its corner point speed of 3000rpm. It is supplied from a pwm converter whose maximum voltage is 200V rms. Neglecting resistance and all other losses, estimate the maximum speed at which maximum current can be supplied to the motor.**	C403.5	E
	OR		
16.b	**Derive the relationship between magnetic field intensity and flux density by performing magnetic circuit analysis of brushless dc motor on open circuit**	C403.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Model Exam			Date/Session	10.10.19	Marks	100
Course code	EE6008	Course Title	Micro controller based system design			
Batch No.		Duration	3 Hrs.	Academic Year	2019 - 2020	
Year/	IV	Semester/Section	VII/A&B	Department	EEE	

Part – A(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Write the significance of Brown-out-reset and watchdog timer	C406.1	U
2.	Mention any 3 instructions used for data transfer in PIC16x microcontroller and give its syntax	C406.1	R
3.	What is meant by Polling routine and Mainline overrun?	C406.2	U
4.	What is the Role of GIE in PIC microcontrollers?	C406.2	U
5.	Microcontroller based control is more advantageous than conventional control - Justify	C406.3	R
6.	Draw the structure of multicycle instruction in 3 stage pipeline.	C406.5	U
7.	State the function of ARMulator and define its operation at various levels.	C406.5	R
8.	What is the role of coprocessor?	C406.6	AZ
9.	State the function of CPSR.	C406.6	R
10.	List down the different operating modes of ARM processor	C406.4	R

Part – B(Answer all the questions 5 x 13= 65marks)

Q. No.	Questions	CO	Skills
11.a	Draw and explain the architecture of the PIC16C74A microcontroller	C406.1	U
	(Or)		
11.b	Briefly explain about the different addressing modes in PIC16X	C406.1	U
12.a	Explain the interrupt logic using timer2 interrupt (PIC16C74A) with necessary circuits	C406.2	U
	(Or)		
12.b	Explain in detail about the interrupt service routine and loop time subroutines along with example programs.	C406.2	A
13.a	Exhibit the operation I2C bus and develop embedded C program to transmit data using I2C bus.	C406.3	U
	(Or)		
13.b	Explain the PIC interfacing with peripherals that includes ADCs with timer and sensors.	C406.3	U
14.a	Explain the ARM programmer's model in detail with supporting diagram.	C406.4	R
	(Or)		
14.b	Write short notes on ARM MMU structure.	C406.4	R
15.a	Using suitable example, explain the various instruction set of ARM processor.	C406.5	E
	(Or)		
15.b	Explain how does the coprocessor interface work.	C406.5	R

Part – C (Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	Write short notes on 3-stage and 5-stage pipeline of ARM processor.	C406.6	AZ
	(Or)		
16.b	Elaborate the working principle of VLSI ISDN subscriber processor in detail.	C406.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Model Exam			Date/Session	12.10.19	Marks	100
Course code	EE6701	Course Title	High Voltage Engineering			
Batch No.		Duration	3 Hours	Academic Year	2019 - 2020	
Year/	IV	Semester/Section	VII/A&B	Department	EEE	

Part – A(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What are the causes for power frequency overvoltage in power system	C401.1	R
2.	What is isokeraunic level?	C401.1	R
3.	What are electronegative gases? Give example.	C401.2	C
4.	What are pure liquid dielectrics?	C401.2	AZ
5.	What are the advantages of Vande-Graff generator?	C401.3	AZ
6.	Draw the standard impulse Waveform.	C401.3	AZ
7.	What are the advantages of CVT measurement in HVAC?	C401.4	AZ
8.	What type of measuring devices preferred for measurement of high frequency impulse current?	C401.4	R
9.	Define disruptive discharge voltage.	C401.5	U
10.	What is meant by insulation coordination	C401.5	R

Part – B(Answer all the questions 5 x 13= 65marks)

QNo.	Questions	CO	Skills
11.a	Explain in detail about the protection of transmission lines against overvoltage.	C401.1	A
	(Or)		
11.b	i)Explain the theories of charges formation in clouds. ii)Derive the mathematical model for lightning discharges.	C401.1	U
12.a	Explain in detail about various mechanisms of breakdown in vacuum.	C401.2	U
	(Or)		
12.b	Explain the various theories of breakdown mechanism of the commercial liquid dielectrics.	C401.2	R
13.a	.What is Tesla Coil? How is damped high frequency oscillations obtained from a Tesla coil?	C401.3	AZ
	(Or)		
13.b	Describe with a neat sketch the working of a Vande Graff Genarator. What are the factors that limit the maximum voltage obtained?	C401.3	E
14.a	Explain the construction features and operation of generating type voltmeter.	C401.4	E
	(Or)		
14.b	Explain the operation of Electrostatic Voltmeter with a neat sketch and give its advantages and limitations.	C401.4	R
15.a	Explain the direct and synthetic testing of isolators and circuit breakers in detail.	C401.5	AZ
	(Or)		
15.b	Explain in detail about the insulation coordination.	C401.5	U

Part – C(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	Discuss the various tests carried out in a circuit breaker at HV labs	C401.5	R
	(Or)		
16.b	Explain in sequence the various HV test being carried out in Power Transformers	C401.5	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Model Exam			Date/Session	09-10-19/FN	Marks	100
Course code	EE6702	Course Title	Protection and Switchgear			
Batch No.		Duration	180 mins	Academic Year		2019 - 2020
Year	IV	Semester/Section	VII / A & B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the effects of short circuit faults on power system, if the fault remain uncleared?	C402.1	U
2	How protective relays are classified based on their functions?	C402.1	U
3	Differentiate time graded system and current graded system used in overcurrent protection.	C402.2	R
4	What are the factors affecting the performance of differential relays?	C402.2	U
5	In the event of faults in generator windings, filed excitation is to be suppressed as early as possible. Why?	C402.3	R
6	Which types of protection scheme is preferred for EHV and UHV power lines?	C402.3	U
7	In what way the static relays are meritorious than electromagnetic relays?	C402.4	R
8	List the electronic circuits commonly used in a static relays.	C402.4	R
9	Why the rate of rise of restriking voltage plays important role in circuit breaker operation?	C402.6	U
10	Why oil circuit breakers are not suitable for heavy current interruption at low voltages?	C402.6	R

Part – B

(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11(a)	Discuss the following neutral grounding schemes. Illustrate your answers with appropriate phasor diagrams, benefits and recommendations. i) Resistance earthing (5) ii) Reactance earthing (3) iii) Arc suppression ciol (5)	C402.1	U
	Or		
11(b)	(i) Describe the essential requirements of protective relaying schemes. (6) (ii) Explain in detail the fault current calculation using symmetrical component. (7)	C402.1	U
12(a)	Explain various time-current characteristics of an over current relay with relevant applications. Also comment about the techniques to realize those time-current characteristics using electro mechanical relays. (13)	C402.2	U
	Or		
12(b)	Explain the construction and operating principles of distance relay with their types for the protection of transmission line. (13)	C402.2	U
13(a)	Explain the types of protective schemes employed for transmission line and bus bar protection. (13)	C402.3	U
	Or		
13(b)	An alternator rated at 10 kV protected by the balanced circulating current system has its neutral grounded through a resistance of 10 ohms. The protective relay is to set to operate when there is an out of balance current of 1.8 A in the pilot wires which there is an out of balance current of 1.8 A in the pilot wires which are connected to the secondary windings of 1000/5 CT ratio. Determine the percentage of winding, which remains unprotected and	C402.3	U

	minimum value of earthing resistance required to protect 80% of the winding. (13)		

14(a)	**Discuss in detail, the integrating type and instantaneous type static amplitude comparators. Illustrate your answer with appropriate circuits and waveforms.(13)**	**C402.4**	**U**
	Or		
14(b)	**How static over current relays are different from electromechanical over current relays? Explain how the operation of instantaneous overcurrent relay is achieved using electronic circuits. (13)**	**C402.4**	**U**
15(a)	**Derive the expression to find the critical value of resistance to be connected across the circuit breaker contacts and the expression for RRRV.(13)**	**C402.5**	**U**
	Or		
15(b)	**Explain the following terms in detail:** **i. Resistance switching. (5)** **ii. Current chopping. (3)** **iii. Interruption of capacitive current. (5)**	**C402.5**	**U**

Part – C

(Answer all the questions 1 x 15 = 15 marks)

Q. No.	Questions	CO	Skills
16(a)	**Describe the construction details, operating principle and applications of minimum oil circuit breaker. (13)**	**C402.6**	**U**
	Or		
16(b)	**Describe the construction details, operating principle and applications of Vacuum circuit breaker. (13)**	**C402.6**	**U**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Incharge : Dr.C.Krishnakumar, Professor & HoD/EEE and Mr.P.K.Arun Kumar, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Model Exam			Date/ Session	01.10.2019 /FN	Marks	100
Course code	MG6851	Course Title	PRINCIPLES OF MANAGEMENT			
Batch No.		Duration	180 mins	Academic Year	2019-20	
Year	Final Year	Semester/ Section	VII/A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Define Management	C404.1	U&C
2	What are the functions of Managers?	C404.1	U&C
3	What is planning?	C404.2	U&C
4	State any two methods of training	C404.2	U&C
5	What is job description?	C404.3	U&C
6	What is intrinsic motivation?	C404.3	U&C
7	What is informal communication?	C404.3	U&C
8	State the various needs of Maslow theory.	C404.4	U&C
9	What are budgets?	C404.5	U&C
10	State the different types of control	C404.6	U&C

Part – B

(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11	(a) Explain briefly the different approaches to management (Or) (b) What are Henry Fayol's 14 principles of management?	C404.1	U&C
12	(a) What is MBO? What are its benefits and limitations? (Or) (b) Discuss the planning process in detail	C404.2	U&C
13	(a) Explain the different organizational structures in detail (Or) (b) Explain the concepts of centralization and decentralization along with their advantages and disadvantages	C404.3	U&C
14	(a) Describe the barriers involved in effective communication (Or) (b) Explain the characteristics of organizational culture. How cultural diversity is managed?	C404.4	U&C
15	(a) Describe the process of controlling (Or) (b) Write in detail about the various types of budgets	C404.5	U&C

Part – C

(Answer all the questions 1 x 15= 15 marks)

Q. No.	Questions	CO	Skills
16	What makes an effective leader? Substantiate with any 2 theories of Leadership.	C404.6	U&C

2019-2020 - EVEN SEMESTER

INTERNAL ASSESSMENT QUESTION

PAPERS

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/ Session	13//02/2020	Marks	50
Course code	BE8255	Course Title	BASIC ELECTRICAL, ELECTRONICS & MEASUREMENT ENGINEERING			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	I	Semester/ Section	II / A&B	Department	CSE & IT	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the advantages & disadvantages of Renewable energy sources?	C110.3	U
2	What are the applications of Solar energy?	C110.3	U
3	Define Tariff	C110.3	R
4	Define COP	C110.3	R
5	Define primary & secondary cell	C110.3	R
6	What are the advantages of earthing?	C110.3	U
7	Define Circuit Breaker.	C110.3	U
8	What are the illumination?	C410.2	U
9	Define i. cut in voltage ii. Break down voltage	C110.4	R
10	What is Zener diode? Mention some applications of Zener diode.	C110.4	A

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q.No.	Questions	CO	Skills
11	Explain in detail about solar power generation system. Also define the advantages, Disadvantages and application of the same.	C110.3	U
	or		
12	Explain in detail about construction and operation of refrigerator with its electrical circuit diagram.	C110.3	U
13	With a neat diagram explain the working of Sodium vapour lamp and mention the applications.	C110.3	A
	or		
14	Discuss the importance of Earthing, Fuse and Circuit breaker in an electrical circuit? and mention their types.	C110.3	R
15	Explain the characteristics of PN junction diode under forward and reverse biased condition.	C110.4	AZ
	Or		
16	Draw the circuit and explain the input and output characteristics of Common Emitter configuration.	C110.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name: Dr.S.Vijayalakshmi (CSE-A-sec), Mrs.C. Pearlin kamalini (CSE-B-sec) & S. Ramprakash (IT)

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/ Session	12/02/2020	Marks	50
Course code	EE6010	Course Title	HIGH VOLTAGE DIRECT CURRENT TRANSMISSION			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	IV	Semester/ Section	VIII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write the disadvantages of AC transmission over long distance.	C410.1	R
2	What is SCR?	C410.1	U
3	How do we select voltage rating of HVDC link?	C410.1	U
4	Write the disadvantages of dc transmission.	C410.1	R
5	Define MTDC.	C410.1	R
6	Write the types of dc link.	C410.1	U
7	Choice for DC interconnection will be based on consideration of _____ And _____	C410.1	R
8	What is meant by pulse number in a converter?	C410.2	U
9	How converter configuration is selected?	C410.2	AZ
10	What is meant by Line Commutated Converter?	C410.2	R

Part – B
(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11 a	Compare AC and DC transmission on technical performance. (5)	C410.1	U
11 b	Discuss the application of DC transmission. (5)	C410.1	U
	or		
12	Explain in detail about planning for HVDC transmission	C410.1	R
13	Define and Describe in detail about DC breaker, operation and its advantages.	C410.1	R
	or		
14	Explain about modern trends in DC transmission system	C410.1	U
15	For a 3 phase Graetz circuit, draw the timing diagram considering overlap angle is less than 60 degree and without overlap for the same.	C410.2	AZ
	or		
16	Explain the analysis of 2&3 valve, 3 valve conduction mode.	C410.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name: Mr.B. Paranthagan (A-sec) & Dr.S.Vijayalakshmi (B-sec)

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/Session	11.02.2020/FN	Marks	50
Course code	EE6801	Course Title	Electrical Energy Generation, Utilization and Conservation			
Batch No.		Duration	90 Mins	Academic Year	2019 - 2020	
Year/	IV	Semester/Section	VIII / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skills
1	Define Electrical drive.	C409.1	R
2	Suggest suitable drives for lifts and cranes.	C409.1	R
3	Write the expression for total tractive effort.	C409.1	E
4	Define gear ratio.	C409.1	R
5	With respect to traction system, explain the term “free running”.	C409.1	AZ
6	Define dead weight and adhesive weight as applied to a locomotive.	C409.1	R
7	Sketch the speed-time curve of a sub-urban railway system.	C409.1	A
8	Define luminous efficiency.	C409.2	R
9	List the types of lighting system.	C409.2	R
10	What is luminous flux?	C409.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

11.a	i.	A sub-urban electric train has a maximum speed of 65kmph.The schedule speed including a station stop of 30seconds is 43.5kmph.If the acceleration is 1.3kmphps; Calculate the value of retardation when the distance between stops is 3km. (8)	C409.1	A
	ii.	Mention the type of motor is used for electric traction.	C409.1	R
		Or		
11.b		Discuss in detail about series-parallel control of electric traction motor with example.	C409.1	AZ
12.a		What are the various types of electric braking used in traction? Discuss any two types in detail.	C409.1	R
		Or		
12.b	i.	Describe and prove laws of illumination.	C409.2	AZ
	ii.	Explain in detail the principle of operation of sodium vapour lamp.	C409.2	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

13.a	A train weighing 203 tonnes accelerates uniforms from the rest to a speed of 45kmph up a gradient of 1 in 500, the time taken being 30 seconds. The power is then cut off the coasts down as uniform gradient of 1 in 1000 for a period of 40 seconds when brakes are applied for period of 15 seconds so as to bring the train uniformly to the rest on this gradient. Estimate, (i)The maximum power output from the driving axle, (ii)The energy taken from the conductor rails in Kwh. Assume efficiency is 60%, traction effort is 44 Newton/Tonne at all speed, rotational inertia is 10%.	C409.1	E
	Or		
13.b	Two street lamps are 20m apart and are fitted with a 500 C.P. lamp at a height of 8m above the ground each. Calculate the illumination at a point, (a) Under the lamps each. (b) Midway between the lamps	C409.2	A

Bloom’s Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

FACULTY : Dr.C.Krishnakumar, Prof/EEE, Dr K.Rajkumar, AP/EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test – I			Date/ Session	09/01/2020 & FN	Marks	50
Course code	EE8005	Course Title	SPECIAL ELECTRICAL MACHINES			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	III	Semester/ Section	VI / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is Switched Reluctance Motor?	C314.3	U
2	What is the need for rotor position sensor in SRM?	C314.3	R
3	Illustrate the different modes of operation of SRM.	C314.3	A
4	Mention the basic requirements of SRM.	C314.3	R
5	List the applications of SRM.	C314.3	A
6	Draw the flux linkage-current characteristics of SRM.	C314.3	U
7	Mention the advantages of SRM.	C314.3	R
8	Show the variation of inductance of phase winding with respect to θ.	C314.3	R
9	What is phase winding?	C314.3	U
10	Calculate the step angle of a 6-phase having 12 stator poles and 8 rotor poles.	C314.3	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the construction and working principle of SRM with a neat diagram	C314.3	U
	Or		
12	With a neat circuit diagram explain any two controller techniques.	C314.3	U
13	Describe the Torque-Speed characteristics of Switched Reluctance Motor	C314.3	U
	Or		
14 a)	Derive the expression for torque developed in Switched Reluctance Motor (6)	C314.3	A
14 b)	What is the step angle of a 5 phase SRM and communication frequency in each phase for the speed 600 rpm having 10 stator poles and 4 rotor poles.(4)	C314.3	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the microprocessor based control of SRM.	C314.3	U
	or		
16	Discuss the control techniques of switched reluctance motor.	C314.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE & Mr.N.Vijayasarathi AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	08-01-2020 FN	Marks	50
Course code	EE8602	**Course Title**	Protection and Switchgear			
Batch No.		**Duration**	90 mins	**Academic Year**	2019-2020	
Year	III	**Semester/ Section**	VI / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	What is meant by relay operating time?	C311.1	R
2	Define burden related to protective relaying.	C311.1	R
3	Define pickup value and plug setting multiplier.	C311.1	R
4	What are the different types of zones of protection?	C311.1	R
5	List out the methods of back up protection.	C311.1	R
6	What is fault clearing time?	C311.1	R
7	What are the different types of fault in power system?	C311.1	R
8	Give any 2 merits of resistance grounded system.	C311.1	R
9	What are the advantages of neutral grounding?	C311.1	R
10	Give the difference between circuit breaker and switch.	C311.1	U

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Describe the essential qualities of protective relaying.	C311.1	R
	OR		
12	Describe the different faults occurring in power system. Which of these are more frequent?	C311.1	U
13	Explain the overlapping of protective zones with a neat sketch.	C311.1	R
	OR		
14	Discuss briefly about the primary and backup protection	C311.1	U

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	Explain the various methods of neutral grounding.	C311.1	R
	OR		
16	Discuss about the different classifications of protective relay.	C311.1	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty: R.Balasubramanian, Assoc Prof./EEE & R.Satheesh, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	07.01.2020/ FN	Marks	50
Course code	EI8451	**Course Title**	Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2019 - 2020	
Year	II	**Semester/ Section**	IV/A	**Department**	ICE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write the different types of DC Generators.	C210.1	R
2	What is meant by Armature reaction in DC Machines?	C210.1	U
3	How can the direction of rotation of DC Motor be reversed?	C210.1	U
4	Distinguish between Lap and Wave windings	C210.1	A
5	Write the necessity of Starter for DC Motor.	C210.1	U
6	Write the conditions that a DC Generator failed to build e.m.f.	C210.1	U
7	What is the critical resistance of a DC shunt Generator?	C210.1	U
8	What are the uses of Brushes in DC Generator?	C210.1	U
9	Compare field and armature control methods.	C210.1	A
10	What is the significance of back e.m.f in DC Motor?	C210.1	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	With neat diagram, explain the construction of DC Generator with significance and materials used for each component.	C210.1	A
	or		
12	A DC Generator when driven at 1000 rpm with a flux per pole of 0.02 Wb produces an emf of 200V. If the speed is increased to 100 rpm and flux per pole is reduced to 0.0121 Wb, what will be the new value of emf?	C210.1	AZ
13	Draw and explain the characteristics of DC Shunt and Series Motors.	C210.1	A
	or		
14	Describe the speed control methods of DC shunt motor and DC series motor	C210.1	A
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	A 230V DC shunt motor runs at 800 rpm and takes armature current of 50A. Find the resistance to be added to the field circuit to increase the speed from 800 rpm to 1000 rpm at an armature current of 80A. Assume flux is proportional to field current. Armature resistance = 0.15 Ω and field resistance = 250 Ω	C210.1	AZ
	or		
16	With neat diagram explain the operation of a Three point Starter.	C210.1	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.P.Ram Prakash, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date	13.02.2020	Marks	50
Course code	BE8253	Course Title	Basic Electrical, Electronics and Instrumentation Engineering			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	I	Semester/ Section	II/ A&B	Department	Mechanical Engineering	

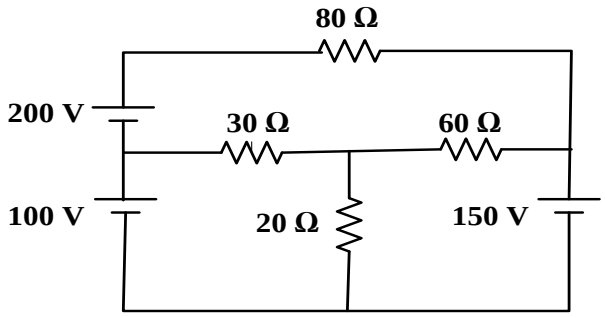
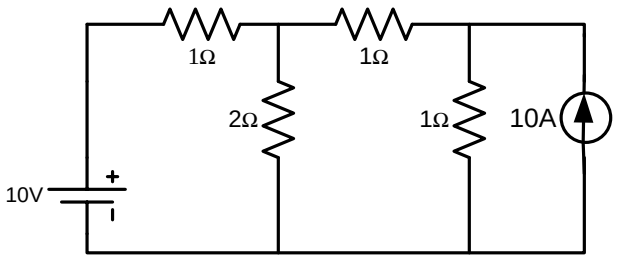
Part – A

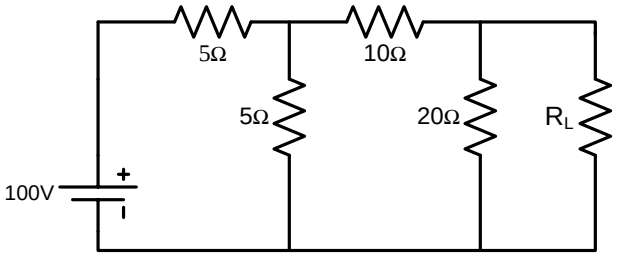
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	State Kirchhoff's Laws.	c112.1	R
2.	State Thevenin's theorem.	c112.1	R
3.	A 50Ω resistor connected in parallel with a 100Ω resistor and the current in the 50Ω resistor is 7.2 A. What is the value of the third resistor to be added in parallel to make the total line current as 12.1A?	c112.1	A
4.	State Ohm's law and its limitations.	c112.1	R
5.	Distinguish between a node and branch in an electrical Circuit.	c112.1	U
6.	What is voltage division principle when two resistors are connected in series?	c112.1	R
7.	State superposition theorem.	c112.1	U
8.	Find the equivalent current source for a voltage source of 100V with series resistance of 2 Ω.	c112.1	A
9.	Write the types of wiring systems.	c112.2	R
10.	List the materials or accessories used for electrical wiring.	c112.2	R

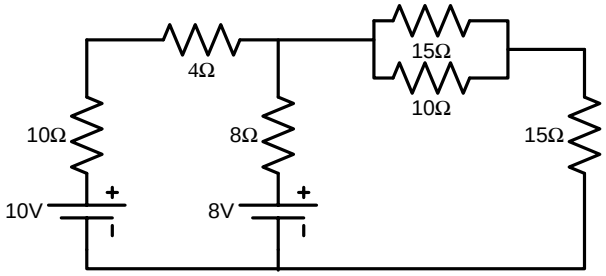
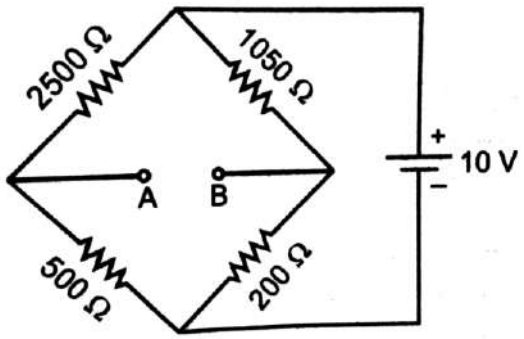
Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Using Mesh analysis, find the current through various branches in the circuit below. 	c112.1	A
	OR		
12.	Determine the branch current at 2 Ω using nodal analysis. 	c112.1	A

13.	Calculate the value of R_L so that maximum power is delivered to the load resistance. 	c112.1	A
	OR		
14.	With Neat diagram, explain the staircase wiring circuit.	c112.2	U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Find the current through the 4Ω resistor using Superposition theorem, in the circuit shown in Fig. 	c112.1	AZ
	OR		
16.	Determine the Thevenin's equivalent circuit of the network given. Also find the current through a 100 Ω galvanometer connected across AB. 	c112.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Members:

Mr.S.Ramprasath, AP/EEE, I-Mech-A
Mr.R.Sridhar, AP/EEE, I-Mech-B

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	06-01-2020/ FN	Marks	50
Course code	EE8601	Course Title	Solid State Drives			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	III rd	Semester/ Section	VI / A & B	Department	EEE	

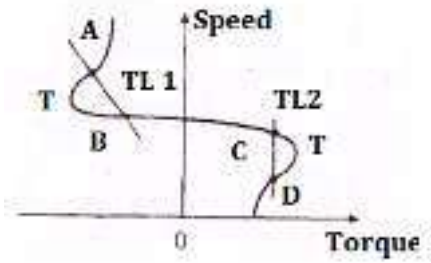
Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skills
1	Sketch the various blocks of an electric drive. What is the function of power modulator?	C310.1	U
2	Draw the torque speed curve of (i) fan load (ii) constant power load	C310.1	R
3	Give the fundamental torque equation that governs the dynamics of motor driving a load and mention the different notations used along with its unit.	C310.1	R
4	What is active and passive load torques? Give examples	C310.1	R
5	What are the different components of electric drives?	C310.1	A
6	State the condition for steady state stability of motor load system.	C310.1	R
7	List the factors to be considered for selection of drive.	C310.2	E
8	A motor of smaller rating can be selected for short time duty. Why?	C310.2	A
9	List different classes of motor duty.	C310.2	A
10	Name four simulation packages that can be used for electrical drives.	C310.2	C

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain in detail the Multi quadrant operation of low speed hoist in speed torque plane.	C310.1	R
	or		
12	Derive the Mathematical expression for steady state stability of equilibrium point.	C310.1	A
13	Explain the selection of a short time rating of a motor and derive the expression for overloading factor 'K' of a motor with continuous rating P_r.	C310.2	A
	or		
14	The Fig 1 shows plots of speed Vs motor torque and Load torques. Comment on the stability of the operation points A, B, C and D.  **Figure 1-speed Vs motor torque and Load**	C310.2	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A constant speed drive has the following duty cycle. (a) load rising from 0 to 400 kW for 5 min (b) uniform load of 500 kW for 5 min (c) Regenerative power of 400 kW returned to the supply for 4 min (d) remaining idle for 2 min. Estimate the power rating of motor. Assume losses to be proportional to square of power.	C310.1	A
	or		
16	A motor has a heating time constant of 60 min and cooling time constant of 90 min. when run continuously on full load of 20 kw, the final temp rise is 40 deg Celsius. What load this motor can deliver for 10 min if this is followed by a shutdown period long enough for it to cool.	C310.1	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge: S.Ramprasath /AP/EEE/SCE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/ Session	13.02.20/ FN	Marks	50
Course code	BE8254	**Course Title**	Basic Electrical & Instrumentation Engg			
Batch No.		**Duration**	90 mins	**Academic Year**	2019-2020	
Year	I	**Semester/ Section**	II / A & B	**Department**	ECE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	List the advantages of 3 phase supply over single phase supply	C212.2	AZ
2	Differentiate balance and unbalanced 3 phase circuits	C212.2	A
3	Define real and reactive power	C212.2	R
4	Write the power equation for single phase and 3 three circuits	C212.2	R
5	Comment on two part tariff	C212.2	U
6	What are the various methods of power factor improvement?	C212.2	U
7	List the formulae for wye delta conversion with diagram	C212.2	R
8	State the rule behind working of DC machine (i)as motor (ii)as generator	C212.3	R
9	List the major components of DC machine construction	C212.3	R
10	Write the emf equation of DC machine (i)as motor (ii)as generator	C212.3	AZ

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Write brief note on Three Phase Power Measurement by two watt meter method also derive the expression for real and reactive power	C212.2	U
	OR		
12	(i) Draw and explain the single line diagram Transmission & Distribution of electrical energy. (ii) Explain the different types of power tariffs	C212.2	U
13	an unbalance delta load is connected to a 3 phase balanced wye supply of 440V, 50Hz where the load impedances were 5+6j, 8-8j, 5 ohms respectively. Calculate line load current, phase current, active power, reactive power, power factor, apparent power.	C212.2	R
	OR		
14	Three identical coils each having a resistance of 10ohms and reactance of 10 ohms are connected in delta across 400V 3 phase supply. Find in each case the line current and the reading on each of the two wattmeter connected to measure the power.	C212.2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss in detail the Constructional Features of DC machines with neat sketch	C212.3	U
	OR		
16	Derive the emf and torque equation of DC machine along with the working principle of DC machine	C212.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	06.01.2020/ FN	Marks	50
Course code	EE8403	**Course Title**	**Measurements and Instrumentation**			
Batch No.		**Duration**	90 mins	**Academic Year**		2019-2020
Year	II	**Semester/ Section**	IV / A & B	**Department**		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Draw the functional block diagram of measuring instruments	C212.1	R
2	Define transducer.	C212.1	R
3	Why statistical treatment is required for measured data?	C212.1	R
4	List the possible principle of operations for analog meters	C212.1	R
5	What are the different standards of measurements	C212.1	U
6	Define calibration.	C212.1	A
7	Differentiate static characteristics from dynamic characteristics of measuring instruments	C212.1	R
8	What are the merits of PMMC meters	C212.1	U
9	List the advantages of digital meters over analog meters	C212.1	R
10	Mention few statistical tools to evaluate measured data	C212.1	AZ

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Discuss in detail the errors and its types which occurs during measuring any quantity	C212.1	U
	OR		
12	Write a short note on Static and dynamic characteristics of measuring instruments	C212.1	U & E
13	With neat sketch, explain the construction, working principle, merits and demerits of PMMC and also derive its torque equation	C212.1	U
	OR		
14	Explain the construction and working principle of moving iron with neat diagram. Also list merits and demerits	C212.1	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Write a brief note on possible Statistical evaluation of measurement data. Also comment on Standards and calibration	C212.1	AZ
	OR		
16	A load test was conducted on a machine and the load current in amperes were 15,22,38,25,33,18,22,20,35,30,31,28,19 Calculate (i) Arithmetic mean, (ii) deviation from the mean, (iii) average deviation, (iv) standard deviation and (v) variance.	C212.1	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

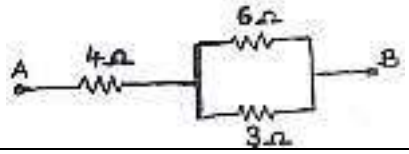
Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date	13-02-20	Marks	50
Course code	BE 8251	Course Title	Basic Electrical and Electronics Engineering			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	I	Semester/Section	II / A	Department	Civil	

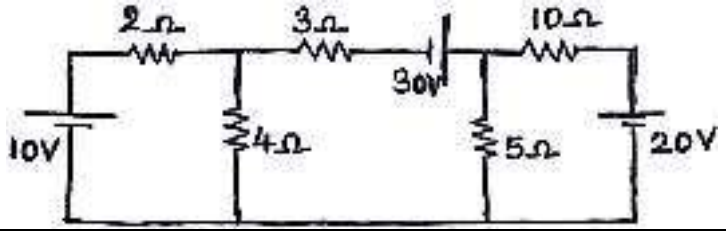
Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Kirchoff's current Law.	C112.1	R
2	State Kirchoff's voltage Law.	C112.1	R
3	Two resistors of 5 ohms & 10 ohms are connected in series. If the total voltage drop across two resistors is 12 V, find the voltage drop across 5 ohms resistor	C112.1	E
4	State Ohm's Law.	C112.1	R
5	Distinguish between mesh and loop of a circuit.	C112.1	U
6	Find the equivalent resistance of the circuit shown in fig. 	C112.1	E
7	Classify the measuring instruments .	C112.1	E
8	Define mutual induction.	C112.1	E
9	Distinguish between core and shell type transformer.	C112.1	R
10	State Current Division Principle.	C112.1	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Find the current supplied by each voltage source in the circuit shown below using Mesh Analysis. 	C112.1	E
	or		
12	Determine the total current taken from the source using network reduction 	C112.1	E
13	Explain the construction and working principle of Permanent magnet moving coil instrument.	C112.1	E
	or		
14	Explain about three phase star connected and delta connected circuits.	C112.1	E

15	Explain briefly about construction and working of a transformer.	C112.2	R
	or		
16	Explain the construction and working Principle of a dc generator.	C112.2	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

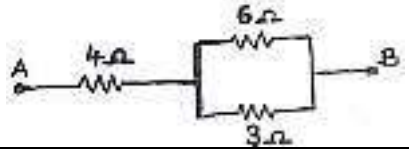
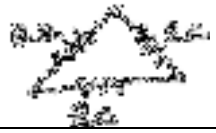
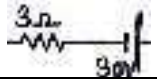
Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date	15-02-20	Marks	50
Course code	EE 8251	Course Title	CIRCUIT THEORY			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	I	Semester/Section	II / A&B	Department	EEE	

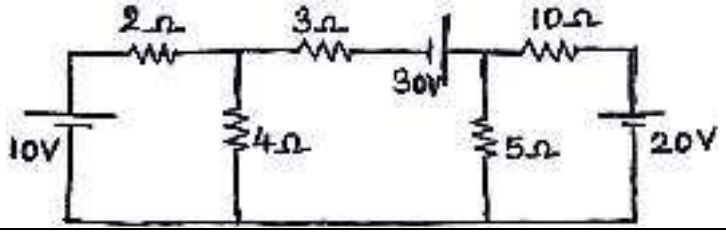
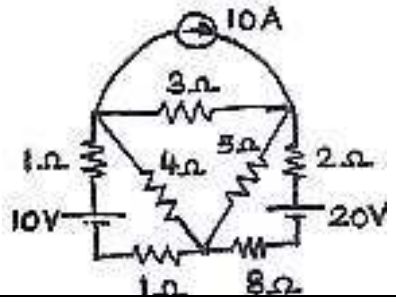
Part – A

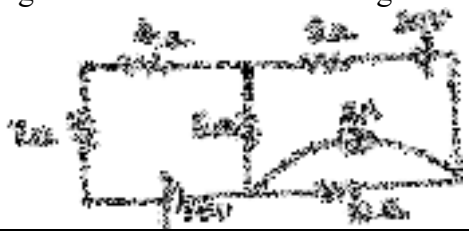
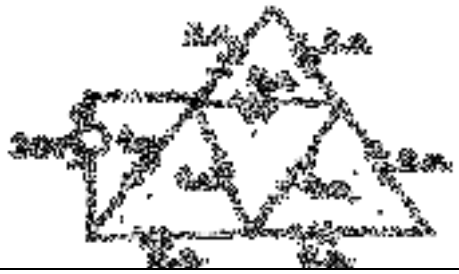
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Kirchoff's current Law.	C113.1	R
2	State Kirchoff's voltage Law.	C113.1	R
3	Two resistors of 5 ohms & 10 ohms are connected in series. If the total voltage drop across two resistors is 12 V, find the voltage drop across 5 ohms resistor	C113.1	E
4	State Ohm's Law.	C113.1	R
5	Distinguish between mesh and loop of a circuit.	C113.1	U
6	Find the equivalent resistance of the circuit shown in fig. 	C113.1	E
7	Convert the given Delta Network into its equivalent star network. 	C113.2	E
8	Convert the voltage source shown in Fig. into its equivalent current source. 	C113.2	E
9	Draw the necessary diagram to show current source to voltage source transformation.	C113.2	R
10	State Current Division Principle.	C113.2	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Find the current supplied by each voltage source in the circuit shown below using Mesh Analysis. 	C113.1	E
	or		
12	Find the loop currents and hence find the power absorbed by 5 ohms resistor. 	C113.1	E

13	Find the node voltages and hence find the voltage across 6 ohms resistor. 	C113.1	E
	or		
14	Find the power dissipated in 10 ohm resistor by nodal analysis method. 	C113.2	E
15	Derive the expressions for star - delta transformation.	C113.2	R
	or		
16	Determine the total current taken from the source using network reduction 	C113.2	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	09.01.2020	Marks	50
Course code	IC8451	Course Title	Control Systems			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year/	II	Semester/ Section	IV / A&B	Department	EEE	

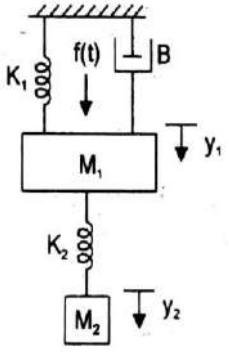
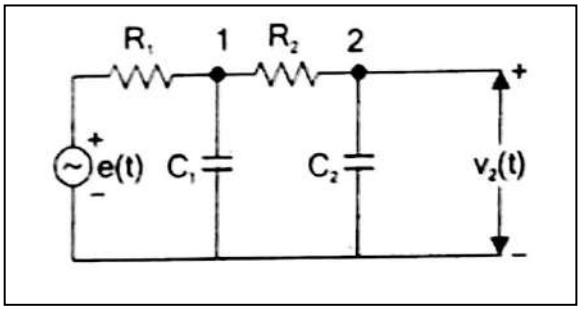
Part – A

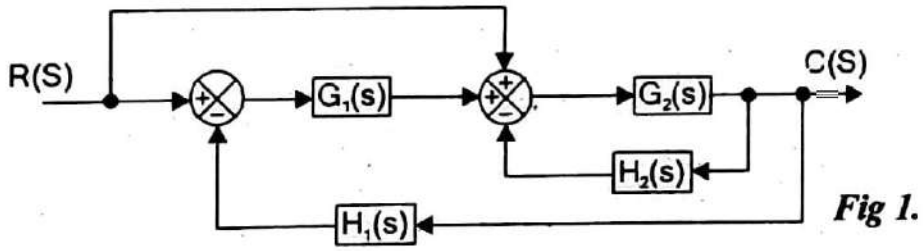
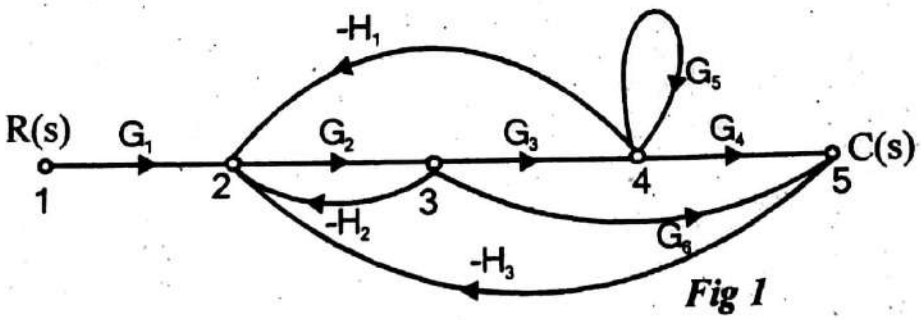
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Distinguish between open loop and closed loop system.	C214.1	U
2	What is linear time invariant systems?	C214.1	R
3	Define transfer function of a system.	C214.1	U
4	Mention the elements used to represent mechanical rotational systems.	C214.1	R
5	What are the electrical analogous elements corresponding to mechanical translational systems?	C214.1	R
6	What you do if a summing point is moved before a block?	C214.1	U
7	Write the rule to eliminate the feedback loop in a block diagram.	C214.1	U
8	Mention the properties of signal flow graph.	C214.1	R
9	Write the Mason's gain formula to determine the transfer function.	C214.1	R
10	Define transmittance in a signal flow graph.	C214.1	R

Part – B

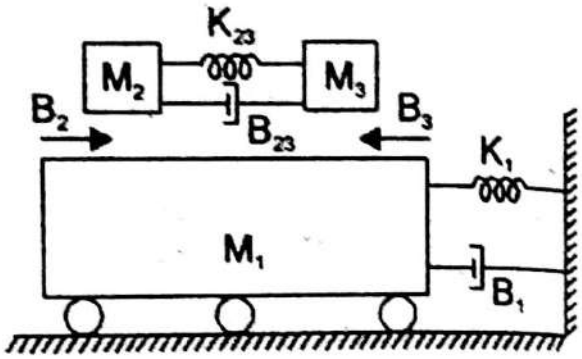
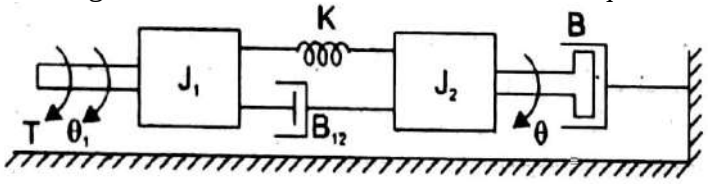
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive the transfer function for the given mechanical translational system. 	C214.1	AZ & E
	(OR)		
12	Derive the transfer function for the given electrical system. 	C214.1	AZ & E

13	Derive the transfer function for the given block diagram.  *Fig 1.*	C214.1	AZ & E
	(OR)		
14	Derive the transfer function for the given signal flow graph.  *Fig 1*	C214.1	AZ & E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Write the differential equations governing the given mechanical system. Draw the electrical analogous circuit and write mesh and nodal equations.  	C214.1	AZ & E
	(OR)		
16	Write the differential equations governing the given mechanical system. Draw the electrical analogous circuit and write mesh and nodal equations.  	C214.1	AZ & E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Members:

Mr.M.Marimuthu, AP//EEE; Mr.R.Sridhar, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	8.01.2020/FN	Marks	50
Course code	EE8402	Course Title	TRANSMISSION AND DISTRIBUTION			
BATCH NO.		Duration	90 mins	Academic Year	2019 - 2020	
Year	II	Semester/ Section	IV / A&B	Department	EEE	

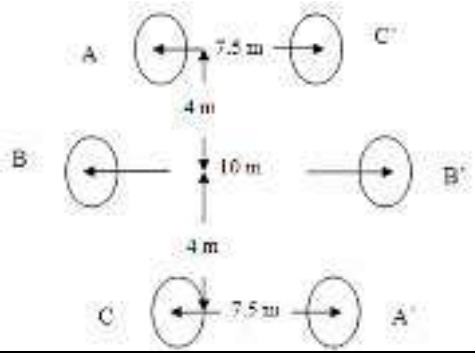
Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define proximity effect on conductors.	C211.1	U
2.	Distinguish between Stranded and Bundled conductors.	C211.1	R
3.	State skin effect in transmission line. Mention its effects on the resistance of the line	C211.1	C
4.	What are the parameters of overhead transmission lines?	C211.1	A,U
5.	What is transposition? Why is transmission line transposed?	C211.1	A
6.	A single phase transmission conductors are 3m apart. The diameter of each conductor is 1.63cm. Examine the inductance per phase per km of the line.	C211.1	E
7.	How inductance and capacitance of a transmission line are affected by the spacing between the conductors?	C211.1	AZ
8.	Define inductance of transmission line. Give its unit.	C211.1	U
9.	Distinguish between GMD and GMR.	C211.1	U, A
10.	What is ACSR conductor?	C211.1	R

Part – B

(Answer all the questions 2 x 10 = 20marks

Q. No.	Questions	CO	Skills
11.	Derive an expression for capacitance of a three phase asymmetrically spaced over head line.	C211.1	C
	OR		
12.	Determine the inductance per km of a double circuit 3 phase line as shown in Fig. The transmission line is transposed within each circuit and each circuit remains on its own side. The diameter of each conductor is 15mm. 	C211.1	E
13.	Derive the expression for calculation the internal and external flux linkages for a conductor carrying current.	C211.1	A
	OR		
14.	Draw and explain the structure of typical electrical power system with various voltage levels.	C211.1	R

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Expression for the inductance of each line when the conductors are unsymmetrical placed	C211.1	A
	OR		
16.	a. A 3 Φ overhead transmission line has its conductors arranged at the corners of an equilateral triangle of 2m side. Calculate the capacitance of each line conductor per km. Given the diameter of each conductor is 1.25cm. (6) b. i) Explain clearly the skin effect and the proximity effects when referred to overhead lines. (4)	C211.1	E

Staff In Charge:
Dr.M.V.Suganyadevi, ASP/EEE, Mr.R.Satheesh, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	10.01.2020 / FN	Marks	50
Course code	EE8401	**Course Title**	Electrical Machines-II			
Batch No.		**Duration**	90 mins	**Academic Year**	2019 – 2020	
Year/	II	**Semester/ Section**	IV	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Compare salient pole and cylindrical rotor.	C210.1	U
2	How is the armature winding in alternators different from those used in DC machine?	C210.1	U
3	Define voltage regulation of an alternator.	C210.1	R
4	What are the causes of changes in voltage of alternators when loaded?	C210.1	U
5	What is meant by armature reaction?	C210.1	U
6	What do you mean by synchronous reactance?	C210.1	R
7	Define the term distribution factor.	C210.1	R
8	What is the significance of having DC field rotating in synchronous machine?	C210.1	U
9	If the values of regulation of two synchronous generators are 0.5% and 3%, which one of the generators will you choose? Why?	C210.1	U
10	Name the type of synchronous generator used in thermal power stations. Why?	C210.1	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Describe the constructional features and working principle of three phase alternator.	C210.1	U
	Or		
12a	Derive the EMF equation of an alternator.	C210.1	R &U
12b	Discuss the effects of alternator on load with relevance to various power factors.		
13	Explain the principle of operation of synchronous motor. Show that a synchronous motor has no net starting torque.	C210.2	R&U
	Or		
14	Explain about the starting methods of synchronous motor.	C210.2	R&U

Part – C (Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	A 16 pole, 3 phase alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.05wb distributed sinusoidally and the speed is 375 rpm. Find the phase emf, line emf and frequency. Assume full pitch coil.	C210.1	R , U, AZ, & E
	Or		
16	A 3 phase star connected alternator has an open circuit line voltage of 6599V. The armature resistance and synchronous reactance are 0.6Ω and 6Ω per phase respectively. Find terminal voltage and voltage regulation, if the load current is 180A at power factor of (i) 0.9 lagging (ii) 0.8 lagging.	C210.1	R , U, AZ, & E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Faculty In Charge : Dr.S.Thamizharasan & Mr. P. Ramesh Babu

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	10.01.2020/FN	Marks	50
Course code	EE8002	Course Title	Design of Electrical Apparatus			
BATCH NO.		Duration	90 mins	Academic Year	2019 - 2020	
Year	III	Semester/ Section	VI / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define specific Electric and magnetic loading. What are the choices of specific electric and magnetic loadings.	C313.1	U
2.	Write an expression for mmf of airgap of (a)smooth armature(b)slotted armature	C313.1	R
3.	What are the problems associated with the calculation of mmf for teeth?	C313.1	A
4.	Distinguish between apparent and real flux density. Write an expression for apparent flux density interms of real flux density.	C313.2	A,U
5.	Define stacking factor.	C313.2	R
6.	What are the factors those limit the design of a machine?	C313.2	U
7.	What is gap contraction factor for ducts?	C313.2	A
8.	What is fringing flux?	C313.2	U
9.	Describe the separation of D and L of a DC machine.	C313.4	U, A
10.	List the advantages and disadvantages of having maximum number of poles in a DC machine and what are the guidelines for selection of no. of poles for a DC machine?	C313.4	R

Part – B

(Answer all the questions 2 x 10 = 20marks

Q. No.	Questions	CO	Skills
11.	a. Determine the apparent flux density in the teeth of a DC m/c when the real flux density is 2.15Tesla.Slot pitch=28mm,slot width=10mm,gross core length=0.35m,No.of ventilating ducts=4,each 10mm wide.The magnetizing force for a flux density 2.15T is 55,000AT/m.The iron stacking factor=0.9. (6 marks) b. Discuss about the various insulating materials. (4 marks)	C313.1	C
	OR		
12.	a. A 350kW,500V,450rpm,6pole,DC generator is built with an armature diameter of 0.87m&core length of 0.32m.The lap wound armature has 660 conductor. Calculate the specific electric & magnetic loading. (5 marks) b. Explain the methods of determination of mmf for teeth. (5 marks)	C313.1	E
13.	a) Derive the output equation of a DC machine in terms of its main dimensions and point out their salient features. (5) b)Calculate the main dimensions of a 20HP, 1000rpm, 400V, DC motor. Given that B_{av}=0.37Wb/m^2, and ac=16,000 amp.cond/m. Assume an efficiency of 90%.	C313.4	A
	OR		
14.	a) A 350kW, 500V, 450rpm, 6pole, DC generator is built with an armature diameter of 0.87m & core length of 0.32m. The lap wound armature has 660 conductor. Calculate the specific electric & magnetic loading. (5) b)Find the main dimensions of a 200kW, 250V, 6pole, 1000 rpm generator. The maximum value of flux density in the gap is 0.87T and the ampere conductors per meter of mature periphery are 31,000. The ratio of pole arc to pole pitch is 0.67 and the efficiency is 91%.Assume ratio of length of core to pole pitch =0.75	C313.4	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	**a.** Calculate the apparent flux-density at a particular section of a tooth from the following data. Tooth width = 12mm, slot width = 10mm, gross core length = 0.32mm, number of ventilating ducts = 4, width of the duct each = 10mm, real flux density = 2.2T, permeability of teeth corresponding to real flux density = 31.4x10-6H/m. Stacking factor = 0.9. (5 marks) b. The stator of a machine has a smooth surface but its rotor has open type of slots with slot width Ws=tooth width,Wt=12mm, and the length of airgap lg=2mm.Find the effective length of airgap if the Cater's co-efficient =1/[1+(5lg/Ws)].There are no radial ducts. (5 marks)	C313.2	A
	OR		
16.	A 50 kW,220V,4pole,DC m/c has the following data:Armature diameter=0.25m, Length=0.125m,flux per pole=11.7mWb,length of airgap at pole centre=2.5mm,the ratio of pole arc to pole pitch =0.66. Calculate the mmf required for airgap (i).if the armature is treated as smooth.(ii).if the armature is slotted and the gap contraction factor is 1.18.	C313.2	E

Staff In Charge:

Dr.M.V.Suganyadevi, ASP/EEE, Mr.P.K.Arun Kumar, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/Session	07.01.20/FN	Marks	50
Course code	EE8691	Course Title	EMBEDDED SYSTEMS			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	II	Semester/Section	VI/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Give examples for embedded systems with justification.	312.1	C
2	What are the constraints in embedded systems?	312.1	R
3	Explain the 2 essential units of a processor on an embedded system.	312.1	U
4	How to select a processor and microcontroller for an application?	312.1	A
5	What are the various forms of system memory used?	312.1	R
6	What is ICE? What for it is used?	312.1	R
7	What is the purpose of DMAC?	312.1	U
8	Distinguish between serial and parallel ports with example.	312.2	AZ
9	Compare synchronous with asynchronous communication.	312.2	R
10	List the ten forms of timer.	312.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain structural unit of an embedded system briefly.	312.1	U
	or		
12	.(i) Describe the concept of DMAC with its block diagram(5) (ii)Explain the concept of ICE and any other device in target hardware debugging.(5)	312.1	U
13	Explain the following hardware units (a) WDT(3) (b) SP (2) (c)Timer (5)	312.1	U
	or		
14	Explain about the functions assigned to various memories in a system.	312.1	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions		Skills
15	Compare RS 232,RS422 &RS 485 in detail with technical specifications	312.2	AZ
	or		
16.	Explain the Serial communication protocols with its Recommended Standard specifications.	312.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: R.Vijay, AP/EEE & B.Paranthagan Asso.Prof/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	10.02.2020 / FN	Marks	50
Course code	EE8691	**Course Title**	EMBEDDED SYSTEMS			
Batch No.		**Duration**	90 mins	**Academic Year**	2019-2020	
Year	III	**Semester/ Section**	6th / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	What is I2C? What are its applications?	312.2	R
2	List out the 4 frames in CAN bus.	312. 2	R
3	What is the need for device drivers?	312. 2	R,A
4	What are the applications of SPI and CAN?	312. 2	R
5	What is UART ?and write its features.	312. 2	C
6	Mention the advantages and drawbacks of prototype model.	312. 3	R
7	What are the issues in hardware software co-design?	312. 3	E
8	What is deployment?	312. 3	U
9	What are the objectives of EDLC?	312. 3	A
10	What is state machine model?	312. 3	U

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	(i)Brief about the interfacing cable which supports full duplex communication.(6) (ii) Explain the concept of I2C and with its applications (4).	312.2	U,A
	OR		
12	Explain the following terms in detail (i)SPI.(5) (ii)CAN.(5)	312.2	U,A,R
13	Discuss about the 3 computational models in embedded design using ACVM.	312.3	A
	OR		
14	Explain the different approaches on Modeling of EDLC .	312.3	E,R

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	Discuss about the state machine model and DFD with a neat diagram and example.	312.3	U,A
	OR		
16	Compare RS 232, RS 422 & RS 485 with its block diagram and technical specifications.	312.3	E,A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty in Charge: R.Vijay, AP/EEE & B.Paranthagan Asso.Prof/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	14//03/2020	Marks	50
Course code	BE8255	Course Title	BASIC ELECTRICAL, ELECTRONICS & MEASUREMENT ENGINEERING			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	I	Semester/ Section	II / A&B	Department	CSE & IT	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the Characteristics of Ideal op-amp?	C110.4	U
2	Draw the circuit of Integrator	C110.4	R
3	What is ADC? Mention the different types of ADC.	C110.4	U
4	What are the applications of 555 timer IC?	C110.4	U
5	What are the features of IC voltage regulator	C110.4	U
6	What are the types of errors in Instrument?	C110.5	U
7	What is standard? What are the different types of standards?	C110.5	U
8	What is the difference between analog and digital instruments?	C410.5	U
9	What is the importance of dynamic characteristics of systems?	C110.5	U
10	List the main functional elements used in most of the measurement systems.	C110.5	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q.No.	Questions	CO	Skills
11	Explain in detail about i. Differentiator ii. RC phase shift Oscillator	C110.4	U
	Or		
12	Draw the block diagram of IC 555 time and explain about mono stable multivibrator.	C110.4	U
13	Explain the construction, operation, and torque equation of PMMC instruments.	C110.5	A
	or		
14	With the necessary block diagram, explain the operation of CRO	C110.5	R
	Part – C (1 x 10 = 10)		
15	Explain the operation of i. Summing amplifier ii. Successive Approximation type ADC	C110.4	AZ
	Or		
16	Explain the operation of i. R – 2R Ladder DAC ii. Low voltage regulator IC 723	C110.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name: Dr.S.Vijayalakshmi (CSE-A-sec), Mrs.C. Pearlin kamalini (CSE-B-sec) & P.Ramprakash (IT)

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date	14-03-20	Marks	50
Course code	BE 8251	Course Title	Basic Electrical and Electronics Engineering			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	I	Semester/Section	II / A	Department	Civil	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define the term Forward biasing in diode.	C112.3	R
2	Define depletion layer.	C112.3	R
3	Define voltage regulation.	C112.3	E
4	State the applications of pn junction diode.	C112.3	R
5	Draw the waveform of full wave rectifier.	C112.3	U
6	Define avalanche breakdown.	C112.3	E
7	What are classification of single phase induction motor.	C112.2	E
8	Define slip in induction motor.	C112.2	E
9	Distinguish between core and shell type transformer.	C112.2	R
10	Write the application of dc shunt motor.	C112.2	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Explain the characteristics of dc shunt , dc series and dc compound motor.	C112.2	E
	or		
12	Explain the working principle of various types of single phase induction motor with neat circuit diagram	C112.2	E
13	Explain the operation of PN junction diode with required circuit and characteristics	C112.3	E
	or		
14	. Explain the operation of half wave rectifiers with relevant waveforms	C112.3	E
15	Explain how you will obtain the static characteristics of common base configuration	C112.3	R
	or		
16	Explain the working of CE configuration of a BJT and draw its input, output characteristics.	C112.3	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	16.03.2020 / FN	Marks	50
Course code	EE6010	Course Title	HIGH VOLTAGE DIRECT CURRENT TRANSMISSION			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	IV	Semester/ Section	VIII / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define characteristic and non characteristic harmonics in HVDC system.	C410.2	AZ
2	Define overlap angle.	C410.2	R
3	Mention the various modes of operation of rectifier characteristics.	C410.2	AZ
4	Draw the equivalent circuit of rectifier.	C410.2	R
5	What is meant by firing angle control?	C410.3	R
6	Draw backs of constant current (CC) control.	C410.3	AZ
7	What are the parameters used to change current and power transfer in DC link?	C410.3	AZ
8	What are the functions of higher level controllers?	C410.3	R
9	What are the starting sequence start up with short pulse firing?	C410.3	U
10	Draw current and extinction angle control.	C410.3	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q.No.	Questions	CO	Skills
11	Explain the combined characteristics of rectifier and inverter.	C410.2	AZ
	Or		
12	With the help of 5 modes of operation, explain the characteristics of 12 pulse converter.	C410.2	AZ
13	Briefly explain system control hierarchy.	C410.3	U
	Or		
14	Draw and explain the basic V-I characteristics of HVDC converter control.	C410.3	AZ
15	Explain firing angle control and also explain types of firing angle control.	C410.3	U
	Or		
16	Explain higher level controllers.	C410.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

FACULTY NAME: Mr.B. Paranthagan (A-Sec) &Dr.S.Vijayalakshmi(B-SEC)

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/Session	12.03.2020/FN	Marks	50
Course code	EE6801	Course Title	Electrical Energy Generation, Utilization and Conservation			
Batch No.		Duration	90 Mins	Academic Year	2019 - 2020	
Year/	IV	Semester/Section	VIII / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skills
1	What is the importance of street lighting?	C409.2	R
2	Why tungsten is selected as the filament material?	C409.2	U
3	Mention the drawbacks of discharge lamps.	C409.2	AZ
4	List the energy saving lights. Mention its necessities.	C409.2	R
5	What is flood lighting? Where is it generally used?	C409.2	U
6	State the properties of a heating element used in indirect resistance heating.	C409.3	R
7	What are the requirements of a good heating material?	C409.3	U
8	Mention the advantages of electric heating.	C409.3	U
9	Define infrared heating.	C409.3	R
10	Mention the factors which limit the choice of frequency in induction and dielectric heating?	C409.3	AZ

Part – B

(Answer all the questions 2 x 10 = 20marks)

11.a		An illumination of 75 lux is to be provided in the workshop hall measuring 40 m × 10 m. Determine the number and rating of the lamps when 7 stretches are provided at mutual spacing of 5 m. Assume depreciation factor as 0.8, coefficient of utilization as 0.4, and the efficiency of lamps as 15 lumens/watt.	C409.2	E
		Or		
11.b	i.	Describe the factors responsible for lighting schemes for roads.	C409.2	R
	ii.	Write notes on the working and construction of LED lamp.	C409.2	U
12.a	i.	Demonstrate the steps to be used for designing a heating element	C409.3	AZ
	ii.	Discuss the requirements of good heating materials.	C409.3	U
		Or		
12.b	i.	Explain the principle and working of welding transformer.	C409.3	R
	ii.	Describe the construction and working of dielectric heating.	C409.3	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

13.a	Discuss briefly the electric welding and its types.	C409.3	U
	Or		
13.b	A piece of insulating material is to be heated by dielectric heating. The size is 10×10×3 cm. A frequency of 20 MHz is used and the power absorbed is 400 W. Calculate the voltage necessary for heating and current that flows in the material. The material has relative permittivity of 5 and powerfactor is 0.05.	C409.3	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

FACULTY : Dr.C.Krishnakumar, Prof/EEE, Dr K.Rajkumar, AP/EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test – II			Date/ Session	12/02/2020 & FN	Marks	50
Course code	EE8005	Course Title	SPECIAL ELECTRICAL MACHINES			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	III	Semester/ Section	VI / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the types of stepper motor?	C413.1	R
2	Define Resolution.	C413.1	R
3	Differentiate VR stepper motor and PM stepper motor	C413.1	U
4	Draw the dynamic characteristics of stepper motor.	C413.1	A
5	What is synchronism in stepper motor?	C413.1	U
6	What is the step angle of a 4 phase stepper motor having 12 stator teeth and 3 rotor teeth?	C413.1	U
7	What is the need for current suppression circuit?	C413.2	U
8	List the types of driver circuits.	C413.2	R
9	Draw the basic block diagram of typical step motor control.	C413.2	R
10	Define lead angle.	C413.2	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the construction and working principle of Permanent Magnet Stepper Motor with a neat diagram	C413.1	U
	Or		
12	Explain the construction and working principle of Hybrid Stepper Motor with a neat diagram	C413.1	U
13	Describe the characteristics of Stepper Motor with neat diagram.	C413.1	AZ
	Or		
14 a)	Derive the expression for torque developed in Stepper Motor (6)	C413.1	A
14 b)	A single stack 3 phase VR stepper motor has a stepping angle of 15º .Find the number of its stator and rotor poles. (4)	C413.1	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the microprocessor based closed loop control of Stepper motor and also list the applications of Stepper motor.	C413.2	U
	Or		
16	Explain in neat sketch the operation of special driver circuits for the improvement of current buildup in stepper motor.	C413.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE & Ms.A.R.Danila Shirly AP/EEE

Saranathan College of Engineering Tiruchirapalli

Internal Assessment Test - II			Date	17-03-2020	Marks	50
Course code	EE8251	Course Title	CIRCUIT THEORY			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	I	Semester / Sec	02 / A & B	Department	EEE & ICE	

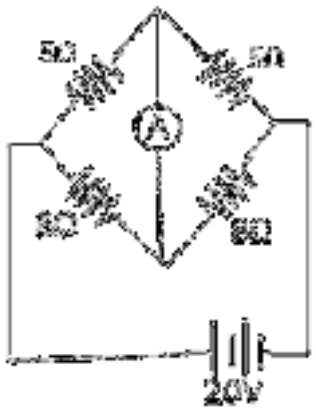
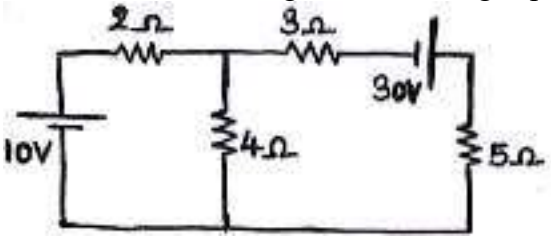
Part – A

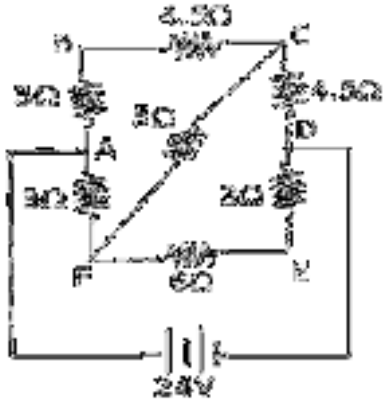
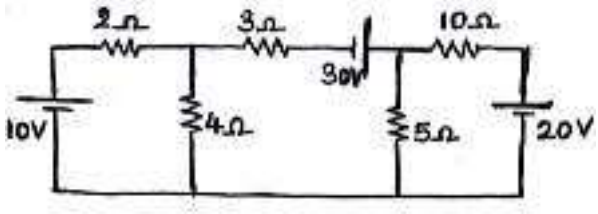
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Superposition theorem.	C113.3	R
2	Draw the Thevenin's Equivalent circuit.	C113.3	C
3	Explain Maximum Power Transfer Theorem	C113.3	U
4	State Norton's Theorem.	C113.3	R
5	State Reciprocity theorem.	C113.3	R
6	State the condition for Maximum Power transfer in DC circuit and some applications of it.	C113.3	A
7	What is phase sequence?	C113.5	U
8	In three phase circuit, what do you mean by balanced load?	C113.5	AZ
9	What are the advantages of three phase system?	C113.5	U
10	Define Line voltage and Phase voltage.	C113.5	AZ

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	Skills	CO
11	Compute the current through the ammeter. Use Norton's theorem 	A	C113.3
	or		
12	Find the current through 3 ohms using superposition theorem. 	A	C113.3

13	Calculate using Thevenin's theorem the current through the branch FC. 	A	C113.3
	or		
14	Use Maximum power transfer Theorem. Find the value of resistance for which maximum power is transferred across 5ohm.(RL) 	A	C113.3
15	Derive the relationship between the phase voltage and line voltage of a three phase star connected load.	AZ	C113.5
	or		
16	A Balanced star connected load of impedance 8+8jΩ per phase is connected to a 3 phase 230V, 50Hz supply. Find Real, Reactive Powers and Total Volt Amperes	E	C113.5

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty: Mr.R.Balasubramanian Assoc.Prof/EEE, Ms.N.Gayathri AP/EEE , Mr. S.Vigneshwaran, AP/ICE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/ Session	14.03.20/ FN	Marks	50
Course code	BE8254	**Course Title**	Basic Electrical & Instrumentation Engg			
Batch No.		**Duration**	90 mins	**Academic Year**	2019-2020	
Year	I	**Semester/ Section**	II / A & B	**Department**	ECE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the types of starters for DC motor?	C212.3	U
2	What are the major methods of dc motor excitation?	C212.3	A
3	What are the different types of speed control employed in DC machines	C212.3	R
4	List the disadvantages of using ward loenard speed control of DC machine.	C212.3	A
5	Differentiate 4 point starter from 3 point starter.	C212.3	U
6	Differentiate squirrel cage rotor from slip ring Induction motor	C212.4	U
7	What are different types starting of 3 phase induction motor	C212.4	A
8	Why single phase induction motor not self starting?	C212.4	R
9	Draw the equivalent circuit of 3phase Induction motor	C212.4	AZ
10	A 3 phase, 415V, 50Hz, 4 pole induction machine runs at 1440 rpm at no load. Calculate the percentage slip of the machine	C212.4	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	With neat sketch explain the construction and working 3 point starter	C212.3	U
	OR		
12	List the different types of speed control of DC machines and explain the operation with neat sketch.	C212.3	U
13	What are the construction and working of 3 phase induction machines	C212.4	A
	OR		
14	With neat diagram explain the working of different types of starters used for 3 phase induction machines.	C212.4	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the different types of single phase induction machine with neat diagram.	C212.4	U
	OR		
16	Draw the equivalent circuit for a three phase induction motor at any slip also explain the equivalent circuit of rotor	C212.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	14.03.2020 / FN	Marks	50
Course code	BE8253	Course Title	Basic Electrical, Electronics and Instrumentation Engineering			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	I	Semester/ Section	II / A&B	Department	Mechanical Engineering	

Part – A

(Answer all the questions 10 × 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What is phase sequence?	C112.2	UR
2.	Define power factor.	C112.2	R
3.	An alternating voltage is given by v=310sin314t. Calculate its maximum value, RMS & average value.	C112.2	UA
4.	Write the various types of power in an AC circuit.	C112.2	R
5.	Mention the advantages of three phase system over single phase systems.	C112.2	UR
6.	What is meant by balanced load?	C112.2	U
7.	What is the function of commutator in DC machines?	C112.3	U
8.	A 6 pole, lap wound DC generator having 480 conductors and driven at a speed of 1200rpm. The flux per pole is 0.012 wb. Calculate the value of generated emf.	C112.3	UA
9.	Mention some applications of DC generator.	C112.3	UR
10.	Define back emf.	C112.3	R

Part – B

(Answer all the questions 2 × 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Derive the value of form factor and peak factor for a sinusoidal voltage waveform.	C112.2	URA
	OR		
12.	Derive the expressions for current, impedance, phase angle, power factor, various powers of R-C and R-L-C circuits.	C112.2	URA
13.	Explain the different types of DC generator with neat diagram.	C112.3	UR
	OR		
14.	Explain the construction and working principle of DC motor.	C112.3	UR

Part – C

(Answer all the questions 1 × 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Each phase of a three phase load having impedance equal to $20\angle 45^0$ Ω. Determine the line and phase values of voltage and current , various powers when the load is connected in a) Star connection b) Delta connection	C112.2	URA
	OR		

16.	A coil of resistance 5Ω and inductance 100mH is connected in series with a 200μF capacitor across a 220V, 50Hz supply. Calculate inductive reactance, capacitive reactance, impedance of the whole circuit, supply current, power factor, various types of power, voltage across circuit elements. Draw the phasor diagram, depicting the voltage and current.	C112.2	URA

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	11-02-2020/ FN	Marks	50
Course code	EE8601	**Course Title**	Solid State Drives			
Batch No.		**Duration**	90 mins	**Academic Year**	2019 - 2020	
Year/	III	**Semester/ Section**	VI / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skils
1	What causes poor input power factor in phase controlled DC drives?	C311.3	AZ
2	What is the function of freewheeling diode in a phase controlled rectifier?	C311.3	AZ
3	What is meant by inversion mode?	C311.3	U
4	Distinguish circulating current mode and Non-circulating current mode?	C311.3	A
5	What is Time ratio Control and Current limit control?	C311.3	U
6	What is a current feedback?	C311.6	U
7	What are the two types of speed controller?	C311.6	U
8	List the methods of speed sensing.	C311.6	U
9	What is a field weakening mode control?	C311.6	R
10	Write down the transfer function of a separately excited DC motor.	C311.6	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	CO	Skills
11	Explain the continuous conduction mode of operation of a fully controlled converter fed separately excited dc motor in details with necessary waveform and equations?	C311.3	R
	or		
12	Describe the operation of a four quadrant chopper fed separately excited DC motor with neat diagram.	C311.3	R
13	Derive and explain from basic principles, the transfer function for separately excited DC motor load system?	C311.6	R
	or		
14	Explain in detail the design of current controller of closed loop speed control system of DC separately excited motor.	C311.6	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	CO	Skills
15	A 220V, 1500 rpm, 50A separately excited DC motor with armature resistance of 0.5Ω is fed from a circulating current dual converter with AC source voltage (line)= 165V. Assuming continuous conduction, determine converter firing angles for (i) Motoring operation at rated motor torque and 950 rpm (ii) Motoring operation at rated torque and -950rpm.	C311.3	A
16	A 250V separately excited DC motor has an armature resistance of 2.5Ω, when driving a load at 600rpm with constant torque, the armature takes 20A. This motor is controlled by a chopper circuit with a frequency of 400Hz and an input voltage of 250V. (a) What should be the value of the duty ratio if one desires to reduce the speed from 600 to 540 rpm, with the load torque maintained constant? (b) Find out the value of duty ratio for which per unit ripple current will be maximum.	C311.3	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge: Dr.S.Thamizharasan/Assoc.Prof./EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/ Session	11.02.20/ FN	Marks	50
Course code	EE8403	**Course Title**	Measurements and Instrumentation			
Batch No.		**Duration**	90 mins	**Academic Year**	2019-2020	
Year	II	**Semester/ Section**	IV / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the different methods of measurement of frequency in the power frequency range?	C212.2	R
2	Explain why it is necessary to make the potential coil circuit purely resistive in watt meters.	C212.2	A
3	List out the methods used for the measurement of phase.	C212.2	R
4	What are the differences between LPF and UPF Wattmeters?	C212.2	R
5	What is meant by creeping in energy meter?	C212.2	U
6	What makes the scale of MI instruments cramped at both lower and upper ends?	C212.2	U
7	State any 2 applications of CT and PT	C212.3	U
8	Define nominal ratio of instrument transformers.	C212.3	R
9	Discuss in brief about hysteresis in B-H Curve	C212.3	U
10	List out the methods used for the measurement of iron loss in ferromagnetic material.	C212.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	With a neat block diagram of Digital Multimeter explain their working principle.	C212.2	U
	OR		
12	On what principle Digital Frequency Meter and Mechanical Resonance Frequency meter works, explain with neat diagram.	C212.2	U
13	Explain the working of two wattmeter method (Delta connection) for three phase power measurement. Also derive two wattmeter method for a balanced star connected load.	C212.2	A
	OR		
14	Describe the constructional details and working principle of single phase induction type energy meter.	C212.2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Give detailed notes on Instrument Transformers.	C212.3	AZ
	OR		
16	Explain any one method of measurement of iron loss with neat schematic arrangement.	C212.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	10.02.2020/ FN	Marks	50
Course code	EI8451	**Course Title**	Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2019 - 2020	
Year	II	**Semester/ Section**	IV/A	**Department**	ICE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	How to minimize iron loss in Transformer?	C210.2	U
2	What are the advantages of three phase Transformer over single phase Transformer?	C210.2	U
3	A 200 kVA single phase transformer with a voltage ratio of 6600 / 660 V has the following winding parameters. $R_1 = 1.56\Omega$, $R_2 = 0.016\Omega$, $X_1 = 4.67\Omega$ and $X_2 = 0.048\Omega$. Calculate the resistance and reactance referred to high voltage side.	C210.2	A
4	Define voltage regulation of Transformer.	C210.2	R
5	List the parts of a single phase transformer.	C210.2	R
6	Why transformer is rated in kVA?	C210.2	U
7	List the starting methods of Synchronous Motor.	C210.3	R
8	Define pitch factor of Alternator.	C210.3	U
9	Which type of alternators used in hydroelectric plants and why?	C210.3	U
10	What are the advantages of rotating field over rotating armature?	C210.3	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(i) Draw and explain the phasor diagram of single phase transformer with inductive load. (5) (ii) A 600kVA single phase transformer has an efficiency of 92% both at full load and half load at unity power factor. Determine its efficiency at 60% of full-load at 0.8 p.f lagging. (5)	C210.2	AZ
	or		
12	Explain the types of three phase transformer connection.	C210.2	A
13	Draw the phasor diagrams of Alternator for the following conditions (i) Lagging power factor (ii) Unity power factor (iii) Leading power factor	C210.3	A
	or		
14	Derive the expression for (i) frequency of Alternator (ii) Generated EMF of Alternator (4+6)	C210.3	A
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	A 5-kVA distribution transformer has a full load efficiency at unity p.f. of 95%. The copper and iron losses being equl. Calculate its all-day efficiency if it is loaded through the 24 hours as follows: 25% of load for 7 hours, 50% load for 5 hours, full load for 2 hours and no-load for 10 hours. Assume the p.f of 0.8 lagging for all loads.	C210.2	AZ
	or		
16	With neat diagram explain open circuit and short circuit tests of single phase transformer and draw the approximate equivalent circuit of transformer.	C210.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.P.Ram Prakash, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	15.02.2020/FN	Marks	50
Course code	EE8401	**Course Title**	Electrical Machines-II			
Batch No.		**Duration**	90 mins	**Academic Year**	2019 – 2020	
Year/	II	**Semester/ Section**	IV/A&/B	**Department**	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	When is a synchronous motor receiving 100% excitation?	C210.2	U
2	What is the role of synchronous motor in a transmission line?	C210.2	R&U
3	What are V-curves?	C210.2	AZ
4	How can change the operating speed of synchronous motor?	C210.2	U
5	What is the effect of increase in excitation of a synchronous motor?	C210.2	U
6	How can the direction of rotation of three phase induction motor be reversed?	C210.3	R
7	Write down the advantages of slip ring induction motor.	C210.3	U
8	What are the purposes that could be served by external resistors connected in the rotor circuit of phase wound induction motor?	C210.3	U
9	What are the advantages of skewing the rotor slots?	C210.3	U
10	What happen when $N=N_s$ in three phase induction motor?	C210.3	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Explain in detail about the effect of varying excitation on armature current and power factor of synchronous motor with constant load.(6)	C210.2	AZ
11 b	Derive the expression for power delivered by a synchronous motor in terms of load angle. (4)	C210.2	U, AZ, A, E
	Or		
12	A 5kw, three phase star-connected 50 Hz, 440 V, cylindrical rotor synchronous motor operates at rated condition with 0.8 power factor leading. The motor efficiency excluding field and stator losses is 95% and X_s= 2.5Ω. Calculate (i) Mechanical power developed (ii) Armature current (iii) Back emf (iv) Power angle (v) Maximum or pull out torque of the motor.	C210.2	U, AZ, A, E
13	(a)Explain the working of a three phase induction motor with a neat sketch. (5) (b) Derive the expression for torque under running condition of a three phase induction motor and obtain the condition for maximum torque.(5)	C210.3	U, AZ, A, E
	Or		
14	Deduce and develop an equivalent circuit for three phase induction motor.	C210.3	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

<table>
<tr><th>Q. No.</th><th>Questions</th><th>CO</th><th>Skills</th></tr>
<tr><td>15</td><td>A 25 kVA, Single phase, 500V,50Hz alternator gave the following open circuit and short circuit values: Effective armature resistance is 0.4 Ω.

<table>
<tr><td>Field current (A)</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td></tr>
<tr><td>EMF (V)</td><td>105</td><td>208</td><td>304</td><td>380</td><td>435</td><td>480</td><td>518</td><td>550</td></tr>
<tr><td>S.C current (A)</td><td>26</td><td>52.5</td><td>80</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
Calculate by synchronous impedance method the full load voltage regulation at 0.8 pf lagging, 0.8 pf leading and UPF.</td><td>C210.1</td><td>U, A, AZ & E</td></tr>
<tr><td colspan="4">Or</td></tr>
<tr><td>16</td><td>A 1000 kVA, Single phase, 2000V, 50Hz alternator gave the following open circuit and short circuit values: Effective armature resistance is 0.2 Ω.

<table>
<tr><td>Field current (A)</td><td>10</td><td>20</td><td>25</td><td>30</td><td>40</td><td>50</td></tr>
<tr><td>EMF (LineV)</td><td>800</td><td>1500</td><td>1760</td><td>2000</td><td>2350</td><td>2600</td></tr>
<tr><td>S.C current (A)</td><td>-</td><td>200</td><td>250</td><td>300</td><td>-</td><td>-</td></tr>
</table>
Calculate by Ampere-turns method the full load voltage regulation at 0.8 pf lagging ,0.8 pf leading and UPF.</td><td>C210.1</td><td>U, A, AZ & E</td></tr>
</table>

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Prepared by Dr.S.Thamizharasan & Mr.P.RameshBabu

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	12.02.2020	Marks	50
Course code	IC8451	Course Title	CONTROL SYSTEMS			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	II	Semester	IV	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define peak time and peak overshoot.	C214.2	R
2	Define damping ratio? How can we classify second order system based on damping ratio?	C214.2	AZ
3	Mention two advantages of generalized error constants over static error constants.	C214.2	R
4	What are the effects of damping ratio on the time response of a second order system?	C214.2	AZ
5	Determine type number and order of the following system $\mathbf{G(S)H(S) = \frac{10}{S^3(S^2+2S+1)}}$	C214.2	A
6	Define static error constants.	C214.2	U
7	Define rise time and delay time.	C214.2	R
8	Draw the block diagram representation of a state model.	C214.5	R
9	State the limitations of state variable feedback.	C214.5	R
10	Write the homogeneous and non homogeneous state equation.	C214.5	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive the expressions for second order system when the input is unit step for underdamped case and sketch the response.	C214.2	E
	(OR)		
12	A positional control system with velocity feedback has $\boldsymbol{G(s) = \frac{16}{S(S+0.8)}}$ & **H(S) = KS +1.** What is the response c(t) to the unit step input. Given that ζ **= 0.5.**	C214.2	AZ
13	The open loop transfer function of a servomechanism with unity feedback is $\boldsymbol{G(s) = \frac{10}{S(0.1S+1)}}$. The input $\boldsymbol{r(t) = a_0 + a_1 t + \frac{a_2}{2} t^2}$ is applied to the system. Determine the steady state error and static error constants.	C214.2	E
	(OR)		
14	The unity feedback system is characterized by an open loop transfer function **is G(s)= K / s(s+10).**Determine the gain K ,so that the system will have a **damping ratio of 0.5**.For this value of K, determine settling time, Peak overshoot and time to Peak overshoot for a unit-step input.	C214.2	E

PART – C (Answer all the questions 1 x 10 = 10marks)			
15	Consider the matrix A. Compute $\mathbf{e^{At}}$ by two methods. $\mathbf{A} = \begin{bmatrix} \mathbf{0} & \mathbf{1} \\ \mathbf{-2} & \mathbf{-3} \end{bmatrix}$	C214.5	C
(OR)			
16	Test whether the given system is observable and controllable $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 2 & -2 & 3 \\ 1 & 1 & 1 \\ 1 & 3 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 11 \\ 1 \\ -14 \end{bmatrix} [u]$ $Y = \begin{bmatrix} -3 & 5 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$	C214.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date / Session	13.02.2020 / FN	Marks	50
Course code	EE8402	Course Title	TRANSMISSION AND DISTRIBUTION			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	II	Semester/ Section	IV / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1.	How is transmission lines classified?	C211.2	R
2.	What is Ferranti effect?	C211.2	R
3.	What is corona?	C211.2	R
4.	Define surge impedance loading.	C211.2	R
5.	Define visual critical disruptive voltage. Will its value be lesser than critical disruptive voltage?	C211.2	U
6.	What are the characteristics of ABCD constants	C211.2	R
7.	Define sag in a transmission line.	C211.3	R
8.	What are the factors affecting sag in a transmission line?	C211.3	R
9.	Define safety factor in design of transmission lines.	C211.3	R
10.	An overhead line has a span of 250 m. The line conductor weight is 648kg/km. Calculate the maximum sag in line of allowable tension of 1500kg.	C211.3	A

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11.	Draw the phasor diagram of a short transmission line and derive an expression for voltage regulation and transmission efficiency.	C211.2	A
	OR		
12.	A 3 phase, 50 Hz, 100 km line has the following constants. Resistance/phase/km = 0.153Ω, Inductance/phase/km = 1.21 mH, Capacitance/phase/km = 0.00956 μF. If the line supplied a load of 20MW at 0.9 pf lagging at 110 kV at the receiving end, calculate sending end current, sending end power factor, regulation and transmission efficiency using nominal T method	C211.2	A
13.	Draw the nominal T circuit for medium length transmission line and derive expressions for sending end voltage and current. Also draw the respective phasor diagram.	C211.2	A
	OR		
14.	A 50 Hz, 3 phase transmission line 30 km long has a total series impedance of 40+j125 ohms and shunt admittance of 10^{-3} mho. The load is 50 MW at 220kV with 0.8 pf lag. Find the sending end voltage, current, power factor and efficiency using nominal pi method.	C211.2	

Part – C
(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15.	Prove that a transmission line conductor between two supports at equal heights takes a form of a catenary.	C211.3	A
	OR		
16.	A transmission line has a span of 275 m between level supports. The conductor has an effective diameter of 1.96 cm and weighs 0.865 kg/m. If the conductor has ice coating of radial thickness 1.27 cm and is subjected to a wind pressure of 3.9 g/cm^2 of projected area. The ultimate strength of the conductor is 8060 kg. Calculate the sag if i. the factor of safety is 2 and weight of 1 c.c. ice is 0.91 g. (5) ii. the factor of safety is 2 and the ice coating is neglected (4) iii. What do you infer from these results? (1)	C211.3	AZ

Staff In Charge: Dr.M.V.Suganyadevi, ASP/EEE, Mr.R.Satheesh, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	14.02.2020/FN	Marks	50
Course code	EE8002	Course Title	Design of Electrical Apparatus			
BATCH NO.		Duration	90 mins	Academic Year	2019 - 2020	
Year	III	Semester/ Section	VI / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What are the components of commutator losses?	C313.4	U
2.	Write the MMF equation for Pole body and Yoke?	C313.4	R
3.	What are the parameters to be considered for the design of shunt field winding	C313.4	A
4.	What is meant by equalizer connections?	C313.4	A,U
5.	Write down the output equation of a single &3-phase transformer.	C313.3	R
6.	What are the different types of core section in transformers?	C313.3	U
7.	Define window space factor	C313.3	A
8.	What are the advantages of stepped cores?	C313.3	U
9.	What is Buchholz relay?	C313.3	U, A
10.	The voltage per turn of a 500kVA,11kV/415V,Δ/Y,3-phase transformer is 8.7V.Calculate the number of turns per phase of LV and HV windings.	C313.3	E

Part – B

(Answer all the questions 2 x 10 = 20marks

Q. No.	Questions	CO	Skills
11.	A 4 pole,25HP,500Volts,600rpm,series motor has an efficiency of 82%.The pole faces are square and the ratio of the pole arc to pole pitch is 0.67.Take B_{av}=0.55Wb/m^2 , ac=17,000AT./m. Obtain diameter and length of the core and particulars of suitable armature winding.	C313.4	E
	OR		
12.	Design a suitable Commutator for a 350kW,600rpm,440V,6pole,DC generator having an armature diameter of 0.75m,No.of coils is 288.Assume suitable values wherever necessary.	C313.4	E
13.	a. Derive an expression for the output equation of a single-phase transformer interms of core and window area. (5 marks) b. Develop the equation of voltage per turn interms of rating of the transformer. Write the design details of winding of single and three phase transformer. (5 marks)	C313.3	A
	OR		
14.	Determine the main dimensions for core &yoke for 5kVA,50Hz,1f,core type transformer. Rectangular core is used in which the long side is twice as short side.Window height is 3 times the width.Voltage /turn is 1.8V.Window space factor is0.2,Current density= 1.8A/mm^2 ,flux density=1Tesla.	C313.3	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	A tank of 500kVA,1f,50Hz,6600/400V,transformer is 110cmx65cmx155cm.Its full load loss is 6.2kW Find a suitable arrangement for cooling tube to limit the temperature rise to 35°C.Take diameter of CT as 5cm,and the average length of tube as 1m.	C313.3	A,E

	OR		
16.	Estimate the main dimensions including conductor area of a 3-phase ,Δ-Y core type transformer rated at 300kVA,6600/440V, 50Hz.A suitable core with 3-steps having a circumscribing circle of 0.25m diameter and a leg spacing of 0.4m is available. Emf per turn=8.5V, current density =2.5A/mm^2 , $a_s=I_s/d \rightarrow a_s=125m^2$,windowspace factor=0.28,stacking factor=0.9.	C313.3	E

Staff In Charge:
Dr.M.V.Suganyadevi, ASP/EEE, Mr.P.K.Arun Kumar, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	13-02-2020 FN	Marks	50
Course code	EE8602	**Course Title**	Protection and Switchgear			
Batch No.		**Duration**	90 mins	**Academic Year**	2019-2020	
Year	III	**Semester/ Section**	VI / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Draw the R-X diagram for the reactance and mho relay.	C311.2	R
2	What is an under frequency relay?	C311.2	R
3	Write the torque equation of the universal relay.	C311.2	R
4	Why a shading ring is provided in an induction disc relay?	C311.2	U
5	What are the difficulties faced in using voltage balance differential relay?	C311.2	U
6	Differentiate electromagnetic relays from static relays.	C311.4	U
7	What is static relay?	C311.4	R
8	List the merits of static relay.	C311.4	R
9	What are the basic circuits used in static relays?	C311.4	U
10	What is phase comparator?	C311.4	U

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Describe the construction and principle of operation of an induction type directional over current relay.	C311.2	R
	OR		
12	With neat diagram, describe the construction and principle of operation of negative sequence relay.	C311.2	R
13	Explain the impedance relay along with its operating characteristics with suitable R-X diagrams.	C311.2	R
	OR		
14	What are the types of differential electromagnetic relays? Explain any two with necessary diagrams.	C311.2	U

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	Describe the construction, working principle and operation of static overcurrent relay.	C311.4	R
	OR		
16	Explain in detail about amplitude and phase comparators as applied to static relays.	C311.4	A

Name of the Faculty: R.Balasubramanian, Assoc Prof./EEE & R.Satheesh, AP/EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test – III			Date/ Session	16/03/2020 & FN	Marks	50
Course code	EE8005	Course Title	SPECIAL ELECTRICAL MACHINES			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	III	Semester/ Section	VI / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define Magnetic remeance.	C413.4	R
2	Mention the classifications of BLPM motor.	C413.4	R
3	List the applications of BLPMSQW motor.	C413.4	U
4	Write the torque equation of BLPMDC motor.	C413.4	A
5	List the applications of BLPMDC motor.	C413.4	U
6	Mention the types of permanent magnet used in BLPM motors.	C413.4	A
7	What is a sine wave motor?	C413.5	U
8	What do you mean by self-control in PMSM?	C413.5	R
9	List the advantages of load commutation.	C413.5	R
10	Draw the phasor diagram of PMSM.	C413.5	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive the emf equation of BLPMSQW motor with corresponding waveforms.	C413.4	AZ
	Or		
12 a)	Explain the torque-speed characteristics of BLPMDC motor (4)	C413.4	U
12 b)	Discuss the function of electronic commutator with a neat diagram.(6)	C413.4	R
13	Explain the construction and working principle of PMSM.	C413.5	U
	Or		
14	A three phase, 16 poles synchronous motor has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03wb, sinusoidally distributed and the speed is 375 rpm. Find the frequency and the phase and line emf. Assume full pitched coil.	C413.5	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the closed loop control of PMSM with a neat diagram.	C413.5	U
	Or		
16	Explain the vector control technique of PMSM.	C413.5	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE & Ms.A.R.Danila Shirly AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III		Date/ Session		12.03.2020/FN	Marks	50
Course code	EE8002	**Course Title**	Design of Electrical Apparatus			
Batch No.		**Duration**	90 mins	**Academic Year**	2019 – 2020	
Year/	III	**Semester/ Section**	VI/A&B	**Department**	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is meant by Dispersion coefficient? What is the effect of this coefficient on induction motors?	C313.5	U
2	On what factors Length of air gap of 3 phase induction motor depends?	C313.5	U
3	Define leakage reactance. What is reactance voltage? Is it beneficial?	C313.5	R
4	State any two rules for selecting rotor slots of squirrel cage induction motor.	C313.5	R
5	How will you separate D and L for Induction machines?	C313.5	U
6	What are the advantages of large air-gap in synchronous machines?	C313.6	U
7	How will you separate D and L for synchronous machines?	C313.6	U
8	What are the effects of SCR on synchronous machine performance?	C313.6	U
9	Write the procedure for the estimation of air gap using SCR.	C313.6	U
10	Write the design detail for Turbo alternator.	C313.6	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Estimate the core dimension, no.of stator slots and no.of stator conductors/slot for a 100kW, 3300V, 12 pole, 50Hz, star connected, slip ring induction motor. Bav=0.4Wb/m^2, ac=25,000amp.cond/m, efficiency=0.9, pf=0.9. Choose the main dimension to give best power factor. The slot loading should not exceed 500AT. (10)	C313.5	A
	Or		
12	Estimate the main dimension, airgap length, stator slots, stator turns per phase and cross sectional area of stator and rotor conductors for a 3φ,15HP,400V, 6pole, 50Hz, 975rpm,induction motor. The motor is suitable for star-delta starting. Bav=0.45Wb/m^2, ac=20,000 amp. cond/m, L/τ=0.85, η=0.9, pf=0.85. (10)	C313.5	A
13 a	Design a cage rotor for a 40HP,3φ,400V,50Hz,6pole,delta connected, induction motor. A full load efficiency of 87%,and a full load power factor of 0.85 may be assumed. Take D=33cm, L=17cm, Stator slots=54, conductor/slot=14. (5)	C313.5	A
13 b	Determine the specific permeance per metre length of a rectangular semi enclosed slot having the following dimension. Slot width=10mm,slot opening=4.5mm,height of conductor=26mm, height above conductor and below wedge=1mm,height of wedge=3.5mm.Limb height=1.5mm.The 3phase, 50 Hz machine has6poles, 3slots /pole/phase. The stator core length=0.12m and there are 225 turns/phase. Calculate the stator slot leakage reactance per phase. (5)	C313.5	A
	Or		
14	Determine the main dimensions of a 70HP,415V,Star connected 6pole induction motor for which specific electric loading is 30,000amp.cond/m, specific magnetic loading =0.51Tesla,take efficiency=90% and power factor as 0.91.Assume pole arc to pole pitch as unity. Estimate the No.of stator conductors, required for a winding in which conductors are connected in two parallel paths, choose a suitable No.of conductors per slot, so that the slot loading does not exceed 750ampere conductor. (10)	C313.5	A

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Determine the output co-efficient, diameter and length for 1500kVA,2200V,3φ,10pole,50Hz,star connected alternator with sinusoidal flux distribution. The winding has 60° phase spread and full pitched coil.ac=30,000amp.cond/m, Bav=0.6Wb/m^2.If the peripheral speed of rotor, must not exceed 100m/sec,and the ratio of pole pitch to pole length to be between 0.6 to 1.Assume airgap length of 6mm.Find also No.of stator conductors. (10)	C313.6	A
	Or		
16	The following data for a 3750kVA,0.8pf,50Hz,10,000Volts,600rpm,delta connected alternator is available. Stator turns/phase is 240,field turns/pole=100,effective area of the pole=0.16m^2,airgap length=12mm.Field current for full load short circuit current=98A.Ampere turn/pole for iron portion=20% of Airgap mmf. Assuming sinusoidal flux distribution, estimate the value of synchronous reactance. The gap contraction factor is 1.1. Kg=1.1 (10)	C313.6	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty Incharge: Dr.M.V.Suganyadevi & Mr.P.K.Arun Kumar

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	14.03.2020 / FN	Marks	50
Course code	EE8402	Course Title	TRANSMISSION AND DISTRIBUTION			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	II	Semester/ Section	IV / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1.	Define puncture and flashover voltages.	211.4	R
2.	What are the tests performed on insulators ?	211.4	A
3.	State the advantages of suspension type insulators.	211.4	R
4.	Define string efficiency of suspension type insulators and list the methods of improving the same.	211.4	R
5.	Distinguish between underground cables and overhead lines.	211.5	A
6.	Why armouring is done in the cables? and why it is not done in single core cable	211.5	R
7.	A single core cable has a conductor diameter of 2.5 cm and insulation thickness of 1.2 cm. If the specific resistance of insulation is 4.5×10^{14}ohm-cm, calculate insulation resistance per km length of the cable.	211.5	A
8.	Mention the problems associated with an EHV transmission?	211.6	R
9.	What are the demerits of HVDC transmission?	211.6	U
10.	What are the types of series controller?	211.6	R

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11.	i. What are the properties of insulators? Also briefly explain about pin and suspension type insulators. Draw the schematic diagram (6) ii. What is static shielding? Explain in detail about its role in improving string efficiency. (4)	211.4	A, R
	OR		
12.	Each line of 3 phase system is suspended by a string of three identical insulators of self –capacitance C Farad. The shunt capacitance of connecting metal work of each insulator is 0.2 C to earth and 0.1 C to line. Calculate the string efficiency of the system if guard ring increases the capacitance to the line if metal work of the lowest insulators to 0.3 C.	211.4	A
13.	Define FACTS and list and explain its objectives. Explain the basic types of FACTS controllers.	211.6	A
	OR		
14.	What are the various types of HVDC links? Explain them in detail.	211.6	R

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15.	A single core lead sheathed cable is graded by using 3 dielectrics of relative permittivity 4, 3 and 2. The conductor diameter is 2 cm and overall diameter is 8 cm i. If the 3 dielectrics are worked at same maximum stress of 40 kV/cm, find the safe working voltage of the cable.(7) ii. What will be the safe working voltage for an ungraded cable assuming the same conductor diameter, overall diameter and maximum dielectric stress? (2) iii. What do you infer from these results? (1)	211.5	AZ
	OR		
16.	Explain the methods grading of cables with neat diagrams and equations	211.5	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III Set-1			Date/Session	17.03.20 /FN	Marks	50
Course code	EE8691	Course Title	EMBEDDED SYSTEM			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year/	III	Semester/Section	VI/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define context switching.	312.4	R
2	Define semaphore.	312.4	U
3	Define process and threads in RTOS.	312.4	R
4	What is preemptive and non preemptive scheduling?	312.4	R
5	Define RTOS with example.	312.4	R
6	What is CCDP? Explain its function.	312.5	R
7	What are the main hardware components of camera?	312.5	R
8	What is ON card and OFF card application?	312.5	AZ
9	Mention the function calls involved in case study of washing machine.	312.5	R
10	What are the components included in smart card?	312.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the types of IPC with its functions and examples.	312.4	U
	or		
12	Write about task scheduling and its types with its advantage and disadvantages	312.4	U
13	With a neat architectural diagram explain the software operations of a washing machine.	312.4	U
	or		
14	Describe any one of the automotive applications with necessary block diagram.	312.4	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions		Skills
15	Explain the case study of smart card with its neat architecture.	312.5	A
	or		
16.	Explain the case study of a digital camera with its neat architecture.	312.5	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: R.Vijay, Ass.Prof/EEE & B.Paranthagan Asso.Prof/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	13-03-2020/ FN	Marks	50
Course code	EE8601	Course Title	Solid State Drives			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year/	III	Semester/ Section	VI / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skils
1	What are the different methods of speed control of three phase induction motor?	C311.4	AZ
2	What are the advantages and disadvantages of stator voltage control method?	C311.4	AZ
3	Write down the consequences of increasing the frequency of induction motor without a change in terminal voltage.	C311.4	U
4	What is meant by super synchronous operation?	C311.4	A
5	Compare voltage source and current source inverter fed drives.	C311.4	U
6	When is a synchronous motor said to be self controlled?	C311.5	U
7	Write any two applications of synchronous motor drives.	C311.5	U
8	When can the synchronous motor be load commutated?	C311.5	U
9	What are the characteristics of self controlled mode operated synchronous motor?	C311.5	R
10	Write down the torque equation of salient pole synchronous motor.	C311.5	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	CO	Skills
11.a.	Draw the circuit diagram and explain the operation of rotor resistance control of three phase induction motor. Mention the advantages and disadvantages of the above method of speed control.	C311.4	R&U
11.b.	Draw the circuit diagram and explain the working of a slip power recovery system using static Kramer drive for a three phase induction motor.		
	OR		
12.a.	Explain in detail the speed control scheme for a three phase induction motor using PWM inverter.	C311.4	R&U
12.b.	Discuss how v/f speed control scheme of a three phase induction motor is similar to the armature voltage control method of a DC motor.		
13	Describe the marginal angle control and power factor control of a synchronous motor with constant v/f ratio.	C311.5	R&U
	OR		
14	Explain in detail about open loop v/f control and self controlled mode of the synchronous motor drive.	C311.5	R&U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	CO	Skills
15.a.	If 40Ω is the resistance and 0.75 is the duty cycle for the induction motor speed control using chopper, what is the effective value of resistance R_e?	C311.4	U, AZ& A
15.b.	A three phase wound rotor induction motor is controlled by a chopper controlled resistance in its rotor circuit. A resistance of 2Ω is connected in the rotor circuit and a resistance of 4Ω is additionally connected during OFF periods of the chopper. The OFF period of the chopper is 4ms. Calculate the average resistance in the rotor circuit for the chopper frequency of 200Hz.		
	OR		
16	A star connected squirrel cage induction motor has the following ratings and parameters. 400V, 50Hz, 4 pole, 1370 rpm, R_1= 2Ω, R_2'=3Ω, X_1=X_2'=3.5Ω. Motor is controlled by a voltage source inverter at constant v/f ratio. Inverter allows frequency variation from 15 Hz to 50Hz. (i) Obtain a plot between the breakdown torque and frequency. (ii) Calculate starting torque and current of this drive as a ratio of their values when motor is started at rated voltage and frequency.	C311.4	U, AZ& A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question Faculty In charge: Dr.S.Thamizharasan, Assoc.Prof./EEE

Saranathan College of Engineering

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Internal Assessment Test – III			Date/ Session	12.03.20/ FN	Marks	50
Course code	EE8403	**Course Title**	Measurements and Instrumentation			
Batch No.		**Duration**	90 mins	**Academic Year**	2019-2020	
Year	II	**Semester/ Section**	IV / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	With the neat circuit diagram, illustrate the balanced equation of Wheatstone bridge	C212.4	A
2	What are the types of DC potentiometer?	C212.4	R
3	With the neat circuit diagram, illustrate the balanced equation of Maxwell's bridge.	C212.4	A
4	Evaluate why there are two conditions of balance in AC bridges?	C212.4	R
5	What is the use of potentiometer in the field of electrical measurement?	C212.4	A
6	What are the main causes of ground loop currents?	C212.4	U
7	Develop a neat block diagram of X-Y recorder.	C212.5	C
8	What is data logger? What are its components?	C212.5	U
9	List the components of laser printer	C212.5	R
10	Generalize the types of printers according to printing methodology	C212.5	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Quote the procedure of measuring a low resistance with help of Kelvin's double bridge. Derive the relation to find unknown resistance.	C212.4	C
	OR		
12	Explain the theory and working principle of Anderson's Bridge. Derive the relation for finding unknown resistance and inductance	C212.4	U
13	Describe the Importance of Grounding. What are the different grounding techniques used?	C212.4	R
	OR		
14	An ac bridge was made up as follows: arm ab, a capacitor of 0.8 μF in parallel with 1 kW resistance, bc a resistance of 3 kW, arm cd an unknown capacitor Cx and Rx in series, arm da a capacitance of 0.4 μF. The supply at 1 kHz is connected across bd and a detector across ac. Determine the value of unknown capacitance Cx, unknown series resistance Rx and dissipation factor	C212.4	E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	With a help of functional block diagram, explain the operation of a Cathode Ray Oscilloscope?	C212.5	E
	OR		
16	Relate and contrast the working, advantages and disadvantages of LED and LCD.	C212.5	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	17.03.2020 /FN	Marks	50
Course code	EE8401	**Course Title**	Electrical Machines-II			
Batch No.		**Duration**	90 mins	**Academic Year**	2019 – 2020	
Year/	II	**Semester/ Section**	IV/A&/B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Under what condition, the slip in an induction motor is (a) negative (b) greater than one?	C210.3	U
2	What is the effect of change in supply voltage on starting torque of induction motor?	C210.3	R&U
3	What is crawling and cogging in induction motor?	C210.3	AZ
4	What are the purposes that could be served by external resistors connected in the rotor circuit of phase wound induction motor?	C210.3	U
5	Why starter is necessary in induction motor?	C210.4	U
6	Write down the methods to control the speed of three phase induction motor from its rotor side.	C210.4	R
7	What will be the effect when stator voltage and frequency of an induction motor are reduced proportionally?	C210.4	U
8	What is meant by slip power recovery scheme?	C210.4	U
9	Why single phase induction motor is not self starting?	C210.5	U
10	Name the motors used in ceiling fan and in lathes.	C210.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	A three phase induction motor has a starting torque of 100% and a maximum torque of 200% of the full load torque. Determine: (1) Slip at which maximum torque occurs; (2) Full load slip; (3) Rotor current at starting in per unit of full load rotor current.	C210.3	U, AZ, A, E
11 b	The power input to the rotor of a three phase, 50Hz, 6 pole induction motor is 75 kW. The rotor emf makes 100 complete alterations per minute. Find (i) slip (ii) motor speed (iii) mechanical power developed (iv) rotor copper loss per phase.	C210.3	U, AZ, A, E
	Or		
12	A 15 kW, 400V, 50Hz, three phase star connected induction motor gave the following test results: No load test: 400V, 9A, 1310W Blocked rotor test: 200V, 50A, 7100W Stator and rotor ohmic losses at standstill are assumed equal. Draw circle diagram and calculate (i) line current (ii) power factor (iii) slip (iv) torque and efficiency at full load.	C210.3	U, AZ, A, E
13	Use double field revolving theory; explain why single phase induction motor is not self starting. Also write short note on stator and rotor construction.	C210.5	U, AZ
	Or		
14	Explain with suitable diagram, the working principle of split phase and capacitor start induction motor.	C210.5	R&U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.a.	Explain the speed control of three phase wound rotor induction motor by rotor resistance method.	C210.4	U
15.b.	Describe variable frequency method of speed control of three phase induction motors.	C210.4	U
	or		
16	Explain various starting methods used for three phase induction motor. Analyse and compare them.	C210.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each questions.

Prepared by Dr.S.Thamizharasan & Mr.P.Rameshbabu

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	13.03.2020/ FN	Marks	50
Course code	EI8451	**Course Title**	Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2019 - 2020	
Year	II	**Semester/ Section**	IV/A	**Department**	ICE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	How to reverse the direction of rotation in three phase Induction motor?	C210.4	U
2	Write the values of slip at the time of starting and at maximum torque.	C210.4	U
3	Compare cage and wound rotor type induction motors.	C210.4	A
4	The power input to the rotor of a 415V, 4 pole, 3 phase induction motor is 55kW. The frequency of the rotor EMF is 2Hz.Find the rotor copper loss and mechanical power developed.	C210.4	U
5	Why an Induction motor never runs at synchronous speed?	C210.4	U
6	Sketch the construction arrangement of shaded pole induction motor.	C210.5	U
7	Why the single phase induction motor is not self-starting?	C210.5	U
8	Is it possible to change the direction of rotation of a shaded pole motor? Justify your answer.	C210.5	U
9	Why an Induction motor is called as a 'rotating transformer'?	C210.5	R
10	Draw the construction diagram of Permanent magnet stepper motor.	C210.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(i) Derive the torque equation of 3φ induction motor at running condition (5) (ii) Write the methods of speed control of 3φ induction motor (5)	C210.4	A
	or		
12	Explain the Stator resistance and star-delta type starters with neat diagrams.	C210.4	A
13	With neat diagram, explain the operation of Split phase, capacitor start, capacitor start-run types of single phase induction motor.	C210.5	A
	or		
14	With neat diagram, explain the operation of Variable reluctance and hybrid stepper motors at various stepping modes.	C210.5	A
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	A 400 V, 50 Hz, 6 pole, delta connected, three phase induction motor consumes 45 kW, with a line Current of 75A and runs at slip of If the stator iron loss is 1200 W, windage and friction loss are 900 W and resistance between two Stator terminals is 0.12Ω, Calculate i) power supplied to rotor ii) Rotor Copper loss iii) Shaft Torque iv) Shaft Power v) Efficiency	C210.4	AZ
	or		
16	A 400V, 50Hz, 4-pole, star connected induction motor takes a line current of 10 A with 0.86 p.f. lagging. Its total stator losses are 5% of the input. Rotor copper losses are 4% of the input to the rotor and mechanical losses are 3% of the input of the rotor. Calculate (i) Slip and rotor speed (ii) Torque developed in the rotor (iii) Shaft torque.	C210.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.P.Ram Prakash, AP/EEE

Saranathan CollegeofEngineering

Tiruchirapalli

Internal Assessment Test –III			Date	16.03.2020	Marks	50
Course code	IC8451	CourseTitle	Control Systems			
BatchNo.		Duration	90 mins	AcademicYear	2019-2020	
Year	II	Semester/ Section	IV /A&B	Department	EEE	

Part – A

(Answerallthe questions10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What are frequency domain specifications?	C214.3	R
2.	Define Gain Margin and Phase Margin.	C214.3	U
3.	What is minimum phase transfer function?	C214.3	R
4.	Draw the polar plot for the system whose transfer function $G(s) = \frac{10}{s^2(s+3)(s+8)}$	C214.3	U
5.	Write the correlation between time and frequency domain response.	C214.3	U
6.	What is asymptotically stable system?	C214.4	R
7.	How the system stability is determined from the roots of the characteristics equation?	C214.4	R
8.	State Nyquist Stability Criterion.	C214.4	R
9.	What is the need of compensation in control system? Mention the types of compensation.	C214.4	R
10.	Draw the electrical circuit of lag network and its pole zero plot.	C214.4	UR

Part – B

(Answerallthe questions2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Sketch the bode plot for the following transfer function and determine the system gain K for the gain cross over frequency of 5rad/sec. $G(s) = \frac{Ks^2}{(1+0.2s)(1+0.02s)}$	C214.3	AZ & E
	(OR)		
12.	The open loop transfer function of a unity feedback system is given by $G(s) = \frac{1}{s(1+s)(1+2s)}$. Sketch the polar plot and determine the gain and phase margin.	C214.3	AZ & E
13.	Explain the design procedure of lead compensator and draw its bode plot.	C214.4	AZ & E
	(OR)		
14.	Derive the transfer function of lag-lead compensator and draw its pole zero plot.	C214.4	AZ & E

Part – C
(Answerallthe questions1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	The open loop transfer function of a unity feedback control system is given by $G(s) = \frac{K(s+1)}{(s^3+as^2+2s+1)}$. Determine the value of K so that the system oscillates at the frequency of 2 rad/sec.	C214.4	AZ & E
	(OR)		
16.	By Nyquist stability criterion, determine the stability of the closed loop system open loop transfer function is given by $G(s) = \frac{(s+2)}{(s+1)(s-1)}$. Comment on the stability of open loop and closed loop system.	C214.4	AZ & E

Bloom'sSkills:Remember(R),Understand(U),Apply (A),Analyze(AZ),Evaluate (E) andCreate (C).Skill needto bementionedagainsteachquestion

FacultyMembers:

Mr.M.Marimuthu, AP//EEE; Mr.R.Sridhar,AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	14.03.2020/FN	Marks	50
Course code	EE8602	Course Title	Protection and Switchgear			
Batch No.		Duration	90 mins	Academic Year	2019-2020	
Year	III	Semester/ Section	VI / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	What is a numerical relay?	311.4	R
2	List some of the limitations of numerical relay.	311.4	U
3	What are the methods of arc interruption?	311.5	R
4	Define recovery voltage	311.5	R
5	What are the factors on which the arc resistance depend?	311.5	R
6	Define first pole to clear factor.	311.5	U
7	What is meant by rupturing capacity of a circuit breaker?	311.6	R
8	Differentiate MOCB from Bulk oil circuit breaker.	311.6	U
9	What are the different types of air blast circuit breakers?	311.6	R
10	What is the range of vacuum used in Vacuum CBs?	311.6	R

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Explain the working of Numerical relay with neat block diagram. State its advantages.	311.4	R
	OR		
12	Explain the operation of numerical overcurrent relay with the help of a block diagram	311.4	R
13	Discuss in detail about the recovery rate theory and energy balance theory of arc interruption in AC circuit breaker.	311.5	R
	OR		
14	Derive an expression for rate of rise of transient recovery voltage (RRRV) and hence obtain the condition for maximum RRRV.	311.5	A

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	With neat sketch describe the construction and operation of SF_6 circuit breakers.	311.6	R
	OR		
16	Classify Bulk oil Circuit breakers. Explain in detail the operation of different types of self blast oil circuit breakers with necessary diagrams.	311.6	R

Name of the Faculty: R.Balasubramanian, Assoc Prof./EEE & R.Satheesh, AP/EEE

2020-2021 - ODD SEMESTER

INTERNAL ASSESSMENT QUESTION

PAPERS

Saranathan College of Engineering Tiruchirappalli - 620012

Internal Assessment Test - 3(Date of Examination : 03/11/2020/AN 3.00 pm to 4: 30 pm)
EE 8301 Electrical mahines -I
II year / III semester / B sec

The respondent's email (**null**) was recorded on submission of this form.
* Required

1. Email *

2. Name of the student *

3. Batch number *

4. 1. An electro-mechanical energy conversion device is one which converts _____ * 1 point

Mark only one oval.

- Electrical energy to mechanical energy only
- Mechanical energy to electrical energy only
- Electrical to mechanical and mechanical to electrical
- None of the mentioned

5. 2. What is the coupling field used between the electrical and mechanical systems in energy conversion devices? * 1 point

Mark only one oval.

- Magnetic field
- Electric field
- Magnetic field or Electric field
- None of the mentioned

6. 3. The energy storing capacity of magnetic field is about _____ times greater than that of electric field. * 1 point

Mark only one oval.

- 50,000
- 25,000
- 10,000
- 40,000

7. 4. The formula for energy stored in the mechanical system of linear motion type is _____ * 1 point

Mark only one oval.

- 1/2 Jwr^2
- 1/2 mv^2
- 1/2 mv
- Jwr^2

8. 5. In an electro-mechanical energy conversion device, which of the following statements are correct regarding the coupling field? (i) electrical side is associated with emf and current (ii) electrical side is associated with torque and speed (iii) mechanical side is associated with emf and current (iv) mechanical side is associated with torque and speed * 1 point

Mark only one oval.

- (i) & (ii)
- (ii) & (iii)
- (iii) & (iv)
- (i) and (iv)

9. 6. singly and doubly - excited magnetic systems are respectively * 1 point

Mark only one oval.

- Loud speakers and tachometers
- synchronous motors and moving iron instruments
- DC shunt machines and solenoids
- reluctance motors and synchronous motors

10. 7. Electromagnetic torque in rotating electrical machinery is present when * 1 point

Mark only one oval.

- air gap is uniform
- stator winding alone carries current
- rotor winding alone carries current
- both stator and rotor windings carry current

11. 8. The developed electromagnetic force and/or torque in electromechanical energy conversion system, acts in such a direction that tends to _____ * 1 point

Mark only one oval.

- increase the stored energy at constant mmf
- decrease the stored energy at constant mmf
- decrease the co-energy at constant mmf
- increase the stored energy at constant flux

12. 9. Magnetic stored energy density in iron is given by(S - reluctance, B - flux density, μ- permeability, φ - flux) * 1 point

Mark only one oval.

- (1/2) φ^2 * S
- (1/2)B^2 *μ
- (1/2)B^2 /μ
- (1/2)B/μ

13. 10. The energy stored in a magnetic field is given by (Ψ - flux linkage) Note : Multiple answers * 1 point

Mark only one oval.

- (1/2)L i^2
- (1/2) φ^2 * S
- (1/2) (mmf)^2* S
- (1/2)Ψ *i

14. 11. A physical system of electromechanical energy conversion, consists of a stationary part creating a magnetic field with electric energy input, and a moving part giving mechanical energy output. If the movable part is kept fixed, the entire electrical energy input will be _____ * 1 point

Mark only one oval.

- stored in the magnetic field
- stored in the electric field
- divided equally between the magnetic and electric fields
- zero

15. 12. For a toroid to extract the energy from the supply system, the flux linkages of the magnetic field must be _____ * 1 point

Mark only one oval.

- zero
- changing or varying
- constant
- any of the mentioned

16. 13. For a linear electromagnetic circuit, which of the following statement is true? * 1 point

Mark only one oval.

- Field energy is less than the Co-energy
- Field energy is equal to the Co-energy
- Field energy is greater than the Co-energy
- Co-energy is zero

17. 14. Consider a magnetic relay with linear magnetization curve in both of its open and closed position. What happens to the electrical energy input to the relay, when the armature moves slowly from open position to closed position? * 1 point

Mark only one oval.

- Welec=Wfld
- Welec=Wmech
- Welec=Wmech/2+Wfld/2
- Welec=0

18. 15. Which of the following are examples of doubly-excited magnetic systems? * 1 point

Mark only one oval.

- Synchronous Machines
- Loudspeakers and Tachometers
- D.C Shunt Machines
- All of the mentioned

19. 16. Most of the electromagnetic energy conversion devices belong to _____ * 1 point

Mark only one oval.

- singly excited magnetic systems
- doubly excited magnetic systems
- multiply excited magnetic systems
- both doubly excited magnetic systems and multiply excited magnetic systems

20. 17. * 1 point

3. In a doubly excited magnetic system with salient pole type stator and rotor, if the rotor is not allowed to move, then the equation for magnetic field stored energy in establishing the currents from zero to i_s and i_r is _____

a) $W_{fld}=1/2\, i_s^2 L_s+1/2\, i_r^2 L_r$

b) $W_{fld}=1/2\, i_s^2 L_s+M_{rs}\, i_s\, i_r$

c) $W_{fld}=1/2\, i_s^2 L_s+1/2\, i_r^2 L_r+M_{rs}\, i_s\, i_r$

d) $W_{fld}=1/2\, i_r^2 L_r+M_{rs}\, i_s\, i_r$

Mark only one oval.

- a
- b
- c
- d

21. 18. In a doubly excited magnetic system of salient pole stator and rotor, the magnetic torque (Te) depends on which of the following statements?(i) the instantaneous values of currents is and ir(ii) the angular rate of change of inductances(iii) the differential changes of current dis and dir(iv) only the instantaneous values of self inductance * 1 point

Mark only one oval.

- (i), (iii)
- (i), (ii)
- (iii), (iv)
- (i), (iv)

22. 19. All practical electro mechanical energy conversion devices make use of the magnetic field rather than the electric field as the coupling medium. This is because _____ * 1 point

Mark only one oval.

- ( ) electric field systems present insulation difficulties
- ( ) electric field systems have more dielectric loss than the magnetic loss, for the same power rating of the machine
- ( ) in electric field systems, for normal electric field strength, the stored energy density is high
- ( ) in magnetic field systems, for normal magnetic flux density, the stored energy density is high

23. 20. For a p-pole machine, which of the following statements are correct regarding the rotating field speed? * 1 point

Mark only one oval.

- ( ) The rotating field speed is 1/(p/2) revolutions in one cycle
- ( ) f/(p/2) revolutions in f cycles
- ( ) f/(p/2) revolutions in one second
- ( ) Any of the mentioned

24. 21. If the phase sequence of supply currents are reversed, then the direction of rotation of the resultant MMF wave will _____ * 1 point

Mark only one oval.

- ( ) Be reversed
- ( ) Remains unchanged
- ( ) Cannot be determined
- ( ) None of the mentioned

25. 22. Which of the following statements are correct regarding individual phase MMF in rotating machines? * 1 point

Mark only one oval.

- ◯ It is a rotating MMF wave
- ◯ It is not a rotating MMF wave and its amplitude doesn't alternate along its own phase axis
- ◯ It is not a rotating MMF wave but its amplitude merely pulsates
- ◯ None of the mentioned

26. 23. The speed at which rotating magnetic field revolves is called _____ * 1 point

Mark only one oval.

- ◯ synchronous speed
- ◯ Asynchrnous speed
- ◯ Rotor mechanical speed
- ◯ stator mechanical speed

27. 24. The amplitude of rotating MMF wave is proportional to _____ * 1 point

Mark only one oval.

- ◯ Nph and P
- ◯ b) I and P
- ◯ c) Nph and I
- ◯ d) Nph, I and P

28. 25. Three phase voltages are applied to the three windings of an electrical machine. If any two supply terminals are interchanged, then the rotating MMF wave _____ * 1 point

Mark only one oval.

- Direction reverses, amplitude alters
- Direction reverses, amplitude unaltered
- Direction remains same, amplitude alters
- Direction remains same, amplitude unaltered

29. 26. A 3 phase star connected winding is fed from symmetrical 3 phase supply with their neutrals connected together. If one of the 3 supply lines gets disconnected, then the revolving MMF wave will have a _____ * 1 point

Mark only one oval.

- Constant amplitude but sub synchronous speed
- Varying amplitude but synchronous speed
- Constant amplitude but super synchronous speed
- Varying speed and a speed fluctuating around the synchronous speed

30. 27. In case of the 3 phase winding with delta or star connection without neutral, if one of the supply lines gets disconnected, then the MMF becomes _____ * 1 point

Mark only one oval.

- Stationary and pulsating
- Rotating with synchronous speed
- Rotating with sub synchronous speed
- Rotating with super synchronous speed

31. 28. If φm is the maximum value of flux due to any one phase, then resultant flux in 2 phase and 3 phase AC machines would respectively be given by _____ * 1 point

Mark only one oval.

- φm and 1.5φm, both rotating
- φm and 1.5φm, both stand still
- φm stand still and 1.5φm rotating
- 1.5φm and 2φm, both rotating

32. 29. One turn consists of _____ * 1 point

Mark only one oval.

- two coil sides
- two conductors
- four conductors
- four coil sides

33. 30. For a P-pole machine, the relation between electrical and mechanical degrees is given by _____ * 1 point

Mark only one oval.

- θelec = (2/P) θmech
- b) θelec = (4/P) θmech
- c) θmech = (P/2) θelec
- θelec = (P/2) θmech

34. 31. A pole pitch in electrical machine _____ * 1 point

Mark only one oval.

- = 180° electrical
- = 180° mechanical
- > 180° electrical
- < 180° electrical

35. 32. The part of the coil in which EMF is generated is known as _____ * 1 point

Mark only one oval.

- end connection
- coil sides
- coil span
- none of the mentioned

36. 33. In a 4 pole machine, what is the flux per pole produced, if the armature length is l and radius is r and Bp is peak value of sinusoidal flux? * 1 point

Mark only one oval.

- 4Bplr
- 2Bplr
- Bplr
- Bplr/2

37. 34. Name the part of the DC machine * 1 point

Mark only one oval.

- field pole
- armature
- Commutator
- Bearing

38. 35. Name the part of the DC machine * 1 point

Mark only one oval.

- field pole
- armature
- Commutator
- Bearing

39. 36. Name the part of the Dc machine * 1 point

Mark only one oval.

- armature
- Commutator
- Bearing
- field system with yoke

40. 37. The filed winding is connected in series with the armature is called _____ * 1 point

Mark only one oval.

- DC series machine
- DC shunt machine
- DC compound machine
- DC separately machine

41. 38. The filed winding of the DC series generator has thick wire and less number of turns * 1 point

Mark only one oval.

- True
- False

42. 39. The filed winding is connected parallel with the armature is called _____ * 1 point

Mark only one oval.

- DC series machine
- DC shunt machine
- DC compound machine
- DC separately machine

43. 40. The filed winding of the DC shunt generator has thin wire and large number of turns * 1 point

Mark only one oval.

- True
- False

Page 4

Part - B (Analytical type questions Q. NO. 41 to 45 each carries 2 marks and Q. NO.46 carries 10 marks)

44. 41. Calculate the emf generated by a 4-pole wave wound generator having 65 slots with 12 conductors per slot when driven at 1200 r.p.m. the flux per pole is 0.02wb * 2 points

Mark only one oval.

- 524 volts
- 342 volts
- 624 volts
- 424 volts

45. 42. A wave connected armature winding has 19 slots with 54 conductors per slot. if the flux per pole is 0.025 wb and number of pole is 8, find the speed at which the generator should be run to give 513 V. Also find the speed if the armature is lap connected. * 2 points

Mark only one oval.

- for wave winding 300 rpm for lap winding 1200 rpm
- for wave winding 1200 rpm for lap winding 300 rpm
- for wave winding 600 rpm for lap winding 1200 rpm
- for wave winding 300 rpm for lap winding 1000 rpm

46. 43. The armature of a 4- pole , 600 rpm, lap wound generator has 100 slots. If each coil has 4 turns, calculate flux per pole required to generate an emf of 300 V. * 2 points

Mark only one oval.

- 37.5 Weber
- 37.5 milli weber
- 3.75 weber
- 375 weber

47. 44. For a four pole, 200 V dc shunt generator having armature resistance of 1 ohms. The current flowing in the armature is 10 A. What is the back emf generated if the terminal voltage of 220 V supply is fed? * 2 points

Mark only one oval.

- 230 Volts
- 210 Volts
- 190 Volts
- 200 Volts

48. 45. Calculate the emf generated per conductor by a 4-pole wave wound generator having 65 slots with 12 conductors per slot when driven at 1200 r.p.m. the flux per pole is 0.02wb * 2 points

Mark only one oval.

- 624 V
- 6.24 V
- 0.8 V
- 0.6 V

49. 46. A 100 kw, 240 V shunt generator has a filed resistance of 55 Ω and armature resistance of 0.067 Ω. calculate the following (i) Load current lL, (ii) Shunt filed winding current lsh (iii) Armature current la (iv) generated voltage Eg (v) Power delivered by armature Pa. * 10 points

Mark only one oval.

- IL = 316.7 A , Ish = 3.36 A , Ia = 421.1 A, Eg = 268.2 V , Pa = 112.93 kW
- IL = 416.7 A , Ish = 4.36 A , Ia = 421.1 A, Eg = 268.2 V , Pa = 112.93 kW
- IL = 316.7 A , Ish = 3.36 A , Ia = 421.1 A, Eg = 238.2 V , Pa = 112.93 kW
- IL = 316.7 A , Ish = 3.36 A , Ia = 421.1 A, Eg = 268.2 V , Pa = 712.93 kW

EE8501-PSA Model Test

Questions Responses 57 Settings Total points: 60

Section 1 of 2

EE8501-PSA Model Test on 17.11.20 FN

Model Test on 17.11.20 MCQ Type

This form is automatically collecting email addresses for SARANATHAN COLLEGE OF ENGINEERING users. Change settings

BATCH NUMBER *

Short-answer text

NAME *

Type your name first with initial(s) at the end

Short-answer text

After section 1 Continue to next section

Section 2 of 2

QUIZ

Description (optional)

Transient reactance is applicable to *

- Transmission line
- Synchronous generator

- 5 x 5
- 5 x 7
- 7 x 5
- 7 x 7

Which one of the following is correct? *

- Static load is represented as power injection in short circuit analysis
- Static load is neglected in short circuit analysis.
- Static load is represented as current injection in short circuit analysis
- Static load is represented as power absorption in short circuit analysis.

A synchronous generator rated for 8 MVA and 12 kV has a reactance of 32%. Its per unit reactance on 16 MVA and 24 kV base is *

- 0.16
- 0.32
- 0.64
- 0.04

In a four-bus power system, bus 1 is the slack bus, buses 2 and 3 are load buses and bus 4 is a generator bus. When power flow analysis is carried out by N.R. method, Jacobian matrix will be of size *

- 3 x 3

EE8501-PSA Model Test

Questions Responses 57 Settings Total points: 60

The power flow equations to be solved in N.R. method are *

- Option 1
- Option 2
- Option 3
- Option 4

For a three-bus power network, the bus admittance matrix is ....Which one of the following is correct? *

- There is a shunt element at bus 1 alone.
- There is a shunt element at bus 2 alone
- There is a shunt element at bus 3 alone
- There are shunt elements at buses 1 and 3.

Power flow solution is *

- steady state solution at normal operating conditions.
- transient solution at normal operating conditions
- steady state solution at no load condition.
- transient solution at no load condition.

- has 2 number of load buses
- has one load bus

While conducting power flow analysis, for the generator bus, unknown quantities are *

- Real power injected and reactive power injected
- Voltage magnitude and voltage phase angle
- Real power injected and voltage magnitude
- Reactive power injected and voltage phase angle

It is required to develop mathematical model for power flow analysis. It is true that *

- both the network equations and bus power equations are non-linear.
- both the network equations and bus power equations are linear.
- network equations are linear and bus power equations are non-linear.
- network equations are non-linear and bus power equations are linear

Which one of the following is correct? *

- |I| > |I'| > |I"|
- |I| < |I'| < |I"|
- |I| > |I'|< |I"|
- |I| < |I'| > |I"|

Xd<Xd'>Xd"

A symmetrical fault occurs in a power system. When the base MVA is taken as 20 MVA, equivalent Thevenin's impedance is computed as j 0.1 p.u. The fault level is *

- 2 MVA
- 20 MVA
- 100 MVA
- 200 MVA

A fault occurs at bus p in a three-power system. The fault conditions are If b = If b = 0 and Vp a = ZfIf a. . The fault type is *

- Symmetrical three phase fault
- Single line to ground fault
- Line to line fault
- Double line to ground fault
- Option 5

The Jacobian matrix computed for NR power flow problem of a 14-bus system is of size 21 x 21. The number of load buses in this power system is *

- 7
- 8
- 5

- Linear algebraic equation
- Non-linear differential equation
- Linear differential equation

The critical clearing time of a fault is power system is related to *

- Reactive power limit
- Short circuit limit
- Steady-state stability limit
- Transient stability limit

Steady-state stability of a power system is the ability of the power system to *

- Maintain voltage at the rated voltage level
- Maintain frequency exactly at 50 Hz
- Maintain a spinning reserve margin at all times
- Maintain synchronism between machines and on external tie lines

Steady-state stability of a power system is improved by *

- Reducing fault clearing time
- Using double circuit line instead of single circuit line
- Single pole switching
- Decreasing generator inertia

- Switching operations
- Fault in the power system
- All of the above

The transient stability limit of a power system can be appreciably increased by introducing *

- Series inductance
- Shunt inductance
- Series capacitance
- Shunt capacitance

In load flow studies of a power system, a voltage control bus is specified by *

- Real power and reactive power
- Reactive power and voltage magnitude
- Voltage and voltage phase angle
- Real power and voltage magnitude

In power system, the maximum number of buses are *

- Generator buses
- Load Bus
- Slack Bus
- All the above

- Active power
- reactive power
- Phase Angle

What type of convergence takes place in NR method? *

- Linear convergence
- Geometric convergence
- Quadratic convergence
- All of these

The number of regional loading dispatching centers in India is *

- 4
- 5
- 29
- 30

Initially what will be the voltage at all the PQ buses for solving the load flow problem using NR method? *

- Vi = 1 ∠ 90°
- Vi = 1 ∠ 0°
- Vi = 1 ∠ 180°
- Vi = 1 ∠ 45°

- Option 1
- Option 2
- Option 3
- Option 4

The range of acceleration factor in GS LF Method for solving power flow equation is between ? *

- 1.2-1.6
- 2.2-2.8
- 3.2-3.9
- 4.2-4.9

A three-phase 100 MVA, 10 kV generator has winding reactance of 1.0 Ω. Its per-unit reactance is *

- 0.01
- 0.1
- 1.0
- 10

In the bus admittance matrix of a transformer-transmission network, the p.u. value of element Y33 = - j 20. A capacitor of impedance of p.u. value – j 2 is now included between bus 3 and the ground. Now the p.u. value of element Y33becomes *

- – j 18

EE8501-PSA Model Test

Questions Responses 57 Settings Total points: 60

At the end of power flow calculation, power flow S12 is obtained as (0.888 – j 0.086) p.u. If the line loss in the line 1-2 is (0.014 – j 0.024) p.u. then power flow S21 is *

- (0.902 – j 0.11) p.u.
- (0.874 – j 0.062) p.u
- (- 0.902 + j 0.11) p.u
- (-0.874 + j 0.062) p.u.

Four identical alternators are in parallel. Each machine is rated for 25 MVA, 11 kV and has a sub-transient reactance of 20 % on its rating. When a three-phase fault occurs at one of the outgoing feeders the short circuit MVA is *

- 625
- 500
- 450
- 1000

In power station three alternator each is rated for 20 MVA and 11kV and sub-transient reactance of 12% on 20 MVA and 11kV base are connected in parallel. A three-phase fault occurs at the bus bars. The short circuit MVA is *

- 500
- 400
- 150
- 250

Option 2

Option 3

Option 4

A 2 MVA, 11 kV generator has positive, negative and zero sequence per unit impedances as j 0.3, j 0.4 and j 0.1 respectively. It is grounded through an impedance of j 0.1 p.u. Single line to ground fault occurs at the terminals of the generator through a fault impedance of j 0.3p.u.Taking generator voltage as reference, currentsla (1) is *

- j 1.0 p.u
- - j 1.0 p.u.
- - j 0.5 p.u
- - j 1.25 p.u.

A synchronous motor is connected to an infinite bus bars and operating at steady state. Which one of the followings is correct? *

Output power = Pmax sin δ and Input power = Pmax cos δ

Output power = a constant and Input power = another constant

Output power = Pmax sin δ and Input power = a constant

Output power = a constant and Input power = Pmax sin δ

Line data of a 2-bus network are shown below.Its Zbusmatrix is? *

A partial network has following data: *

- x = j 0.15; y = j 0.1
- x = j 0.2; y = j 0.25
- x = j 0.35; y = j 0.35
- x = j 0.2; y = j 0.1

Consider the power system shown *

- - j10
- – j 8
- - j 20
- - j 4

The following sequence currents are recorded during a fault conditions in a power system, Ipositive=-j1.653, I negative=j1.653m Izero=o *

- LL
- LG
- LLG

- Only 1 is correct
- Both 1 and 2 are correct
- All are correct
- Only 3 correct

Question *

- Delta-Star Grounded
- Y grounded-Delta
- star-delta
- delta grounded-star

Question *

- Option 1
- Option 2
- Option 3
- Option 4

EE8501-PSA Model Test

Questions Responses 57 Settings Total points: 60

EE8501-PSA Model Test on 4.1.21

Model Test on MCQ Type

The respondent's email (**null**) was recorded on submission of this form.
*Required

1. Email *

2. BATCH NUMBER *

3. NAME *
Type your name first with initial(s) at the end

QUIZ

4. Transient reactance is applicable to * 1 point

Mark only one oval.

- Transmission line
- Synchronous generator
- Transformer
- Load

5. A network has 5 elements connected across 4 buses. Its primitive admittance matrix has the dimension of * 1 point

Mark only one oval.

- 5 x 5
- 5 x 4
- 4 x 5
- 4x 4

6. For a fixed value of complex power flow in a transmission line having a sending end voltage V, the real loss will be proportional to * 1 point

Mark only one oval.

- V
- V^2
- 1/V^2
- 1/V

7. A synchronous generator rated for 8 MVA and 12 kV has a reactance of 50%. Its per unit reactance on 16 MVA and 24 kV base is * 1 point

Mark only one oval.

- 0.25
- 0.32
- 0.64
- 0.04

8. In a four-bus power system, bus 1 is the slack bus, buses 2 and 3 are load buses and bus 4 is a generator bus. When power flow analysis is carried out by N.R. method, Jacobian matrix will be of size * 1 point

Mark only one oval.

- 3 x 3
- 4 X 4
- 5 x 5
- 6 x 6

9. The Gauss Seidel load flow method has following disadvantages. * 1 point

Mark only one oval.

- Unreliable convergence
- Slow convergence
- Choice of slack bus affects convergence
- A good initial guess for voltages is essential for convergence

10. For a power system the admittance and impedance matrices for the fault studies are as follows.The post fault voltages at buses 1 and 3 in per unit respectively are * 1 point

$$Y_{BUS} = \begin{bmatrix} -j8.75 & j1.25 & j2.50 \\ j1.25 & -j6.25 & j2.50 \\ j2.50 & j2.50 & -j5.00 \end{bmatrix} \qquad Z_{BUS} = \begin{bmatrix} j0.16 & j0.08 & j0.12 \\ j0.08 & j0.24 & j0.16 \\ j0.12 & j0.16 & j0.34 \end{bmatrix}$$

Mark only one oval.

- 0.24, 0.63
- 0.31, 0.76
- 0.33, 0.67
- 0.67, 0.33

11. Power flow solution is * 1 point

Mark only one oval.

- steady state solution at normal operating conditions.
- transient solution at normal operating conditions
- steady state solution at no load condition.
- transient solution at no load condition.

12. In a four-bus power system, bus 1 is the slack bus. The Jacobian matrix used in N.R. method is of size 5 x 5. This power system * 1 point

Mark only one oval.

- has 4 number of load buses
- has 3 number of load buses
- has 2 number of load buses
- has one load bus

13. While conducting power flow analysis, for the generator bus, unknown quantities are * 1 point

Mark only one oval.

- Real power injected and reactive power injected
- Voltage magnitude and voltage phase angle
- Real power injected and voltage magnitude
- Reactive power injected and voltage phase angle

14. It is required to develop mathematical model for power flow analysis. It is true that * 1 point

Mark only one oval.

- both the network equations and bus power equations are non-linear.
- both the network equations and bus power equations are linear.
- network equations are linear and bus power equations are non-linear.
- network equations are non-linear and bus power equations are linear

15. Which one of the following is correct? * 1 point

Mark only one oval.

- |I| > |I'| > |I"|
- |I| < |I'| < |I"|
- |I| > |I'|< |I"|
- |I| < |I'| > |I"|

16. In the case of synchronous machine which one of the following is correct? * 1 point

Mark only one oval.

- Xd>Xd'>Xd"
- Xd<Xd'<Xd"
- Xd>Xd'<Xd"
- Xd<Xd'>Xd"

17. A symmetrical fault occurs in a power system. When the base MVA is taken as 20 MVA, equivalent Thevenin's impedance is computed as j 0.1 p.u. The fault level is * 1 point

Mark only one oval.

- 2 MVA
- 20 MVA
- 100 MVA
- 200 MVA

18. A fault occurs at bus p in a three-power system. The fault conditions are If b = If b = 0 and Vp a = ZfIf a. . The fault type is * 1 point

Mark only one oval.

- Symmetrical three phase fault
- Single line to ground fault
- Line to line fault
- Double line to ground fault
- Option 5

19. The Jacobian matrix computed for NR power flow problem of a 14-bus system is of size 21 x 21. The number of load buses in this power system is * 1 point

Mark only one oval.

- 7
- 8
- 5
- 6

20. Swing equation used in transient stability analysis is * 1 point

Mark only one oval.

- Non-linear algebraic equation
- Linear algebraic equation
- Non-linear differential equation
- Linear differential equation

21. Equal area criteria is applicable for * 1 point

Mark only one oval.

- Single-machine system
- Two-machine system
- Multi-machine system
- All the above

22. Steady-state stability of a power system is the ability of the power system to * 1 point

Mark only one oval.

- Maintain voltage at the rated voltage level
- Maintain frequency exactly at 50 Hz
- Maintain a spinning reserve margin at all times
- Maintain synchronism between machines and on external tie lines

23. Steady-state stability of a power system is improved by * 1 point

Mark only one oval.

- Reducing fault clearing time
- Using double circuit line instead of single circuit line
- Single pole switching
- Decreasing generator inertia

24. Transient disturbances are caused by * 1 point

Mark only one oval.

- Sudden load changes
- Switching operations
- Fault in the power system
- All of the above

25. The transient stability limit of a power system can be appreciably increased by introducing * 1 point

Mark only one oval.

- Series inductance
- Shunt inductance
- Series capacitance
- Shunt capacitance

26. In load flow studies of a power system, a voltage control bus is specified by * 1 point

Mark only one oval.

- Real power and reactive power
- Reactive power and voltage magnitude
- Voltage and voltage phase angle
- Real power and voltage magnitude

27. In power system, the maximum number of buses are * 1 point

Mark only one oval.

- Generator buses
- Load Bus
- Slack Bus
- All the above

28. In power system, if a voltage controlled bus is treated as a load bus then which one of the following limits would be violated ? * 1 point

Mark only one oval.

- Voltage
- Active power
- reactive power
- Phase Angle

29. What type of convergence takes place in NR method? * 1 point

Mark only one oval.

- Linear convergence
- Geometric convergence
- Quadratic convergence
- All of these

30. In load flow analysis, the load connected at a bus is represented as * 1 point

Mark only one oval.

- constant current drawn from the bus
- constant impedance connected at the bus
- voltage and frequency dependent source at the bus
- constant real and reactive power drawn from the bus

31. Initially what will be the voltage at all the PQ buses for solving the load flow problem using NR method? * 1 point

Mark only one oval.

- Vi = 1 ∠ 90°
- Vi = 1 ∠ 0°
- Vi = 1 ∠ 180°
- Vi = 1 ∠ 45°

32. The positive sequence component of the voltage at the point of fault in a power system is zero for a _____ fault * 1 point

Mark only one oval.

- LG Fault
- LLG Fault
- LL Fault
- Symmetrical Fault

33. The range of acceleration factor in GS LF Method for solving power flow equation is between ? * 1 point

Mark only one oval.

- 1.2-1.6
- 2.2-2.8
- 3.2-3.9
- 4.2-4.9

34. For a fault at the terminals of a synchronous generator, the fault current is maximum for a * 2 points

Mark only one oval.

- 3-phase fault
- 3-phase to ground fault
- line to ground fault
- line to line fault

35. In the bus admittance matrix of a transformer-transmission network, the p.u. value of element Y33 = - j 20. A capacitor of impedance of p.u. value – j 2 is now included between bus 3 and the ground. Now the p.u. value of element Y33becomes * 2 points

Mark only one oval.

- – j 18
- – j 19.5
- – j 20.5
- – j 22

36. Steady state stability of a power system is the ability of the power system to * 2 points

Mark only one oval.

- maintain voltage at the rated voltage level
- maintain frequency exactly at 50 Hz
- maintain a spinning reserve margin at all times
- maintain synchronism between machines and on external tie lines

37. Negative sequence current flows * 2 points

Mark only one oval.

- In case of all unbalanced faults
- In case of fault involved with ground only
- In case of fault not involving with ground
- In case of symmetrical fault

38. In power station three alternator each is rated for 20 MVA and 11kV and sub-transient reactance of 12% on 20 MVA and 11kV base are connected in parallel. A three-phase fault occurs at the bus bars. The short circuit MVA is * 2 points

Mark only one oval.

- 500
- 400
- 150
- 250

39. In the load flow analysis, Jacobian is represented as [H N,M L]For decoupled load flow analysis the assumptions made are * 2 points

Mark only one oval.

- M = 0; L = 0
- H = 0; L = 0
- M = 0; N = 0
- H = 0; N = 0

40. A 2 MVA, 11 kV generator has positive, negative and zero sequence per unit impedances as j 0.3, j 0.4 and j 0.1 respectively. It is grounded through an impedance of j 0.1 p.u. Single line to ground fault occurs at the terminals of the generator through a fault impedance of j 0.3p.u.Taking generator voltage as reference, currentsla (1) is * 2 points

Mark only one oval.

- j 1.0 p.u
- - j 1.0 p.u.
- - j 0.5 p.u
- - j 1.25 p.u.

41. Use of double line to transmit power is helpful in * 2 points

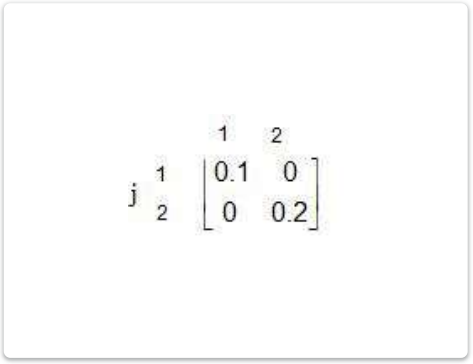
Mark only one oval.

- increasing power capability
- increasing stability
- both (a) and (b)
- decreasing power capability

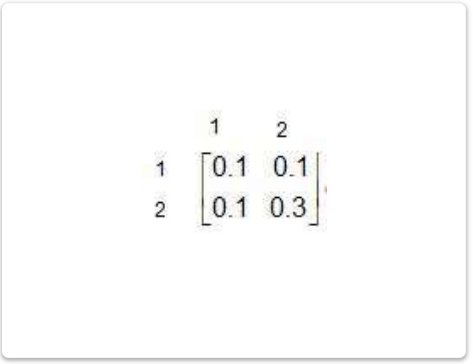
42. Line data of a 2-bus network are shown below.Its Zbusmatrix is? * 2 points

Ele. No.	From bus	To bus	Impedance
1	0	1	j 0.1
2	1	2	j 0.2

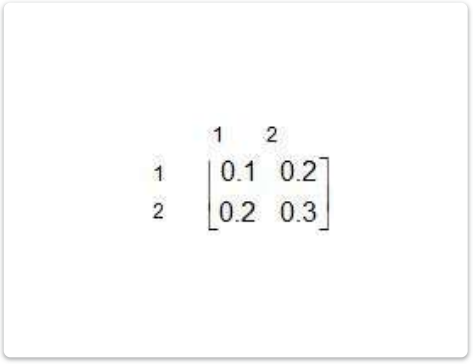
Mark only one oval.



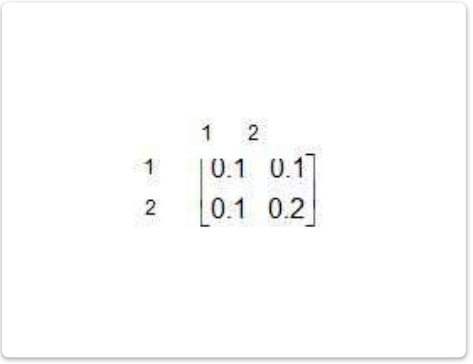
Option 1



Option 2



Option 3



Option 4

43. A partial network has following data: * 2 points

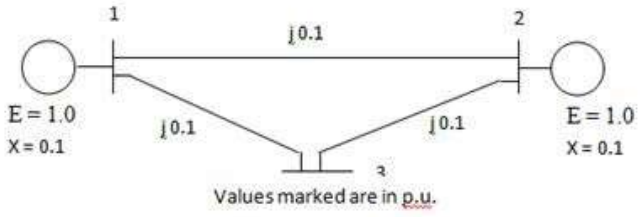
Element	Primitive Impedance
0 - 1	j 0.1
0 – 2	j 0.15
2 - 3	x
1 - 4	y

$$\begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \end{array} \begin{array}{c} \begin{array}{cccc} 1 & 2 & 3 & 4 \end{array} \\ \begin{bmatrix} j0.1 & 0 & 0 & j0.1 \\ 0 & j0.15 & j0.15 & 0 \\ 0 & j0.15 & j0.35 & 0 \\ j0.1 & 0 & 0 & j0.35 \end{bmatrix} \end{array}$$ Then

Mark only one oval.

- x = j 0.15; y = j 0.1
- x = j 0.2; y = j 0.25
- x = j 0.35; y = j 0.35
- x = j 0.2; y = j 0.1

44. Consider the power system shown * 2 points



Three-phase fault occurs at bus 3. Per-unit value of fault current is

Mark only one oval.

- - j10
- – j 8
- - j 20
- - j 4

45. The following sequence currents are recorded during a fault conditions in a power system, Ipositive=-j1.653, I negative=j1.653m Izero=o * 2 points

Mark only one oval.

- LL
- LG
- LLG
- 3phase

46. * 2 points

If the symmetrical component complex operator $\alpha = 1\angle 120°$, then among following relations,

1. $1 + \alpha + \alpha^2 = 0$
2. $1 + \alpha^4 + \alpha^5 = 0$
3. $1 - \alpha^3 = 0$

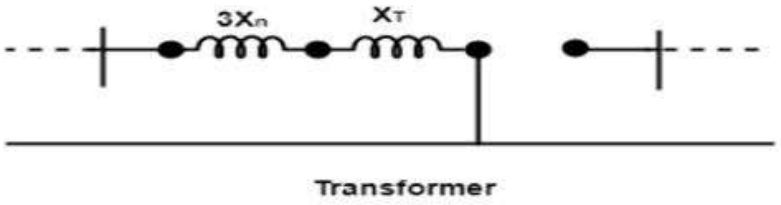
Choose the correct option

Mark only one oval.

- Only 1 is correct
- Both 1 and 2 are correct
- All are correct
- Only 3 correct

47. * 2 points

Given sequence network is for which type of transformer connection.



Mark only one oval.

- Delta-Star Grounded
- Y grounded-Delta
- star-delta
- delta grounded-star

48. *

2 points

The transformers connected in the given 4 Bus system (Fig a) must be connected as from (Fig b)-

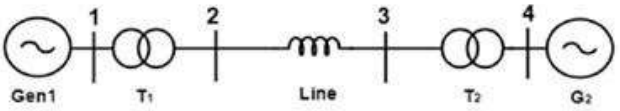


Fig a : Single line diagram

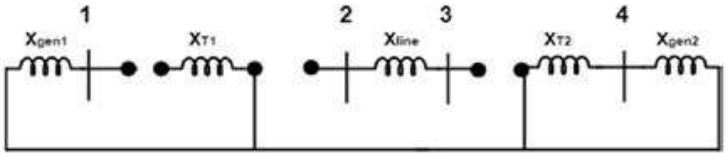


Fig b: Equivalent zero sequence network diagram

Mark only one oval.

T1-Y(ungrounded)-Δ ; T2- Δ-Y grounded

Option 1

T1-Y(grounded)-Δ ; T2- Δ-Y grounded

Option 2

T1- Δ -Y(ungrounded); T2- Y(grounded)-Δ

Option 3

T1- Δ -Y(ungrounded); T2- Y(ungrounded)-Δ

Option 4

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test - I			Date/Session	12.09.2020/AN	Marks	50
Course code	EE8591	Course Title	Digital Signal Processing			
Batch No.		Duration	1 ½ hours	Academic Year	2020-2021/ODD	
Year	III	Semester	05	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	The discrete time function defined as u(n)=n for n≥0;u(n)=0 for n<0 is an a) Unit sample signal b) Unit step signal c) Unit parabolic signal d) Unit ramp signal	C304.1	U
1.(b)	The odd component of a signal x (n) is? a) x(n)+x(-n) b) x(n)-x(-n) c) (1/2)*[x(n)+x(-n)] d) (1/2)*[x(n)-x(-n)]		U
2.(a)	The function given by the equation x(n)=1, for n=0; x(n)=0, for n≠0 is an a) Unit impulse signal b) Unit step signal c) Unit parabolic signal d) Unit ramp signal	C304.1	A
2.(b)	All energy signals will have an average power of: a) Infinite b) Zero c) Positive d) Cannot be calculated		A
3.(a)	What is the Nyquist rate of the signal x(t)=cos(4000*pi*t)+sin(5000*pi*t)-cos(1000*pi*t)? a) 5000Hz b) 1000Hz c) 2000Hz d) 3000Hz	C304.1	U
3.(b)	If '2F' is the frequency of the analog signal, then what is the minimum sampling rate required to avoid aliasing? a) F b) 2F c) 3F d) 4F		U
4.(a)	The process of converting discrete-time continuous valued signal into discrete-time discrete valued(digital) signal is known as: a) Sampling b) Quantization c) Coding d) None of the mentioned	C304.1	A
4.(b)	The difference between the unquantized x(n) and quantized $x_q(n)$ is known as: a) Quantization coefficient b) Quantization ratio c) Quantization factor d) Quantization error		A
5.(a)	Branch Control Input and External Flag pins come under which on-chip peripheral a) Host Port Interface b) General Purpose I/O c) Hardware Timer d) Software programmable wait state generator	C304.6	R
5.(b)	The guard bits present in the accumulator is used as a) Register for Computation b) Peripheral monitor c) Head Margin for Computation d) Normalizing function		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	What is meant by aliasing effect?	C304.1	U
7	Sketch x[n] = {1, 2, 3,-1, 2} and find x [n-3].	C304.1	U
8	Find ODD and EVEN signals for x(n) = { 1,2,1,2,1}	C304.1	A
9	What are the different buses of TMS320C5x processor and list their functions.	C304.6	R
10	What is the function of Parallel Logic Unit?	C304.6	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Test whether the following systems are linear, causal, time-invariant and memory-less (i) y(n) = nx(n)+[x(n+1)] (ii) y(n) = x(2n) (5+5)	C304.1	AZ
	Or		
12	Determine the energy and power of the following signals. (i) $x(n) = (0.5)^n u(n)$ (ii) $x[n] = e^{2n} u[n]$ (5+5)	C304.1	AZ
13	Discuss about the addressing modes used in DSP processor.	C304.6	R
	Or		
14	Draw and explain the architecture of TMS320C50.	C304.6	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	State and prove Sampling theorem.	C304.1	A
	Or		
16	(i) Find the Nyquist Rate and Nyquist interval for the signal x(t) = cos 100π t with F_S = 50Hz (3) (ii) A signal x (t) = sin c(50 πt) is sampled at a rate of (i) 20 Hz (ii) 50 Hz and (iii) 75 Hz. For each of these cases, explain if you can recover the signal x (t) from the sampled signal x(n). (7)	C304.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Mr.P.Ram Prakash, AP/EEE & Ms.A.R.Danila Shirly, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	06.10.2020/ AN	Marks	50
Course code	EE8591	**Course Title**	Digital Signal Processing			
Batch No.		**Duration**	90 mins	**Academic Year**	2020 - 2021	
Year	III	**Semester/ Section**	V/A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	**(a) Define ROC _____** (b) ***z*-transform *X*(*z*) of the sequence *x*(*n*) is given by** a. $X(z)=\sum_{0}^{\infty}x(n)z^{-n}$ b. $X(z)=\sum_{-\infty}^{0}x(n)z^{-n}$ c. $X(z)=\sum_{-\infty}^{\infty}\lvert x(n)\rvert z^{-n}$ d. $X(z)=\sum_{-\infty}^{\infty}x(n)z^{-n}$	C304.2	A
2	***(a)* *z*-transform of the signal** $\{\ldots, 0, \underset{\uparrow}{1}, 3, 2, 0, 0, 0, \ldots\}$ *(i)* $1+3/z+2/z^2$ (iii) $1-3/z-2/z^2$ *(ii)* $1+3z+2z^2$ (iv) $1-3z-2z^2$ ***(b)* ROC of above signal is** (i) RHS of Z-plane (ii) LHS of Z-plane (ii) Outside Z-plane (iv) whole Z-plane	C304.2	R
3	(a) **The interface between an analog signal and a digital processor is** **a.** D/A converter **b.** A/D converter **c.** Modulator **d.** Demodulator (b) **As compared to the analog systems, the digital processing of signals allow** 1) Programmable operations 2) Flexibility in the system design 3) Cheaper systems 4) More reliability a. 1, 2 and 3 are correct b. 1 and 2 are correct c. 1, 2 and 4 are correct d. All the four are correct	C304.6	R
4	**(a) For a partial fraction method to be followed,** **1) The degree of the numerator must be more than the degree of the denominator.** **2) The factors formed for partial fraction are a combination of Linear factors and Irreducible quadratic factors.** **3) The degree of the numerator must be less than the degree of the denominator.** **4) The factors formed for partial fraction are a combination of Linear factors and Square roots.** **a.** 1, 2 and 3 are correct **b.** 1 and 2 are correct **c.** 2 and 3 are correct **d.** All the four are correct	C304.2	R

	(b) **Partial fraction method involves** **a.** Allotting coefficients **b.** Dividing the numerator by denominator to get fractions **c.** Dividing single fraction into parts **d.** None of the above		
5	**(a) The anti causal sequences have _____ components in the left hand sequences.** **a.** Positive **b.** Negative **c.** Both a and b **d.** None of the above (b) **The region of convergence of x/ (1+2x+x^2) is** **a.** 1 **b.** 0 **c.** Negative **d.** Positive	C304.2	A
6	What is the inverse Z-transform of H(z) = 2Z / (Z-0.5)	C304.2	A
7	Write the significance of ROC in Z-Transform.	C304.2	R
8	Determine the Z-Transform and ROC of the finite duration signals x(n)={3,2,2,3,5,0,1} (ii) x(n)=δ(n-k)	C304.6	R
9	State how the spectrum meter application can be designed with DSP	C304.6	A
10	How the DSP can be used for Motor control applications?	C304.6	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(i)Find the Z-Transform and ROC of $x(n) = r^n \cos(n\theta)\, u(n)$ (8) (ii) Find the Transfer function for y(n)-2y(n-z) = x(n)+x(n-1)+y(n-1) (2)	C304.2	AZ
	or		
12	State and prove Convolution and Parseval's Theorem of Z-Transform (4+6)	C304.2	A
13	Explain the following (i) MAC unit of DSP (ii) Pipelining structure of DSP	C304.6	A
	or		
14	Explain various instruction sets of Digital signal Processors with suitable examples	C304.6	A
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	Find the inverse Z-transform of X(z) = (x+1) / (x+0.2)(x-1) using residue method. Compare the result with partial fraction method.	C304.2	AZ
	or		
16	Using z-transform determine the response and stabilty for (i) y(n) = (1/2)y(n-1)+x(n) (ii) x(n) = $(1/3)^n$u(n).y(n-1) (iii) h(n) = 2^nu(n) (4+4+2)	C304.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.P.Ram Prakash, AP/EEE, Ms.A.R.Danila Shirly, AP/EEE.

EE8591 - Digital Signal Processing

Internal Assessment Test - 3

*Required

1. Email *

2. Name of the Student *

3. Batch Number *

4. Year / Section *

Skip to question 5

Quiz

EE8591 - Digital Signal Processing

5. If x(n) and X(k) are an N-point DFT pair, then x(n+N)=x(n). * 1 point

Tick all that apply.

- [ ] True
- [ ] Flse

6. FFT may be used to calculate 1) DFT 2) IDFT 3) Direct Z transform 4) In direct Z transform * 1 point

Mark only one oval.

- 1, 2 and 3 are correct
- 1 and 3 are correct
- 1 and 2 are correct
- All of the Above are correct

7. WN^k+N/2 * 1 point

Mark only one oval.

- WN^k
- -WN^k
- WN^-k
- None of the above are correct

8. The computational procedure for Decimation in frequency algorithm takes * 1 point

Mark only one oval.

- 2Log2 N stages
- Log2 N stages
- Log2 N2 stages
- Log2 N/2 stages

9. If x(n) is a real sequence and X(k) is its N-point DFT, then which of the following is true? * 1 point

Mark only one oval.

- X(N-k)=X(-k)
- X(N-k)=X*(k)
- X(-k)=X*(k)
- All of the Above

10. The DFT is preferred for 1) Its ability to determine the frequency component of the signal 2) Removal of noise 3) Filter design 4) Quantization of signal * 1 point

Mark only one oval.

- 1, 2 and 3 are correct
- 1 and 2 are correct
- 1 and 3 are correct
- All of the above are correct

11. If X(k) is the N-point DFT of a sequence x(n), then circular time shift property is that N-point DFT of x((n-l))N is X(k)e^-j2πkl/N. * 1 point

Mark only one oval.

- true
- False

12. The similarity between the Fourier transform and the z transform is that * 1 point

Mark only one oval.

- ◯ Both convert frequency spectrum domain to discrete time domain
- ◯ Both convert discrete time domain to frequency spectrum domain
- ◯ Both convert analog signal to digital signal
- ◯ Both convert digital signal to analog signal

13. If X(k) is the N-point DFT of a sequence x(n), then what is the DFT of x*(n)? * 1 point

Mark only one oval.

- ◯ X(N-k)
- ◯ X*(k)
- ◯ X*(N-k)
- ◯ None of the mentioned

14. Which of the following is true regarding the number of computations required to compute an N-point DFT? * 1 point

Mark only one oval.

- ◯ N^2 complex multiplications and N(N-1) complex additions
- ◯ N^2 complex additions and N(N-1) complex multiplications
- ◯ N^2 complex multiplications and N(N+1) complex additions
- ◯ N^2 complex additions and N(N+1) complex multiplications

15. What is the circular convolution of the sequences x1(n)={2,1,2,1} and x2(n)={1,2,3,4}? * 1 point

Mark only one oval.

- {14,14,16,16}
- {16,16,14,14}
- {2,3,6,4}
- {14,16,14,16}

16. Which of the following is true regarding the number of computations required to compute DFT at any one value of 'k'? * 1 point

Mark only one oval.

- 4N-2 real multiplications and 4N real additions
- 4N real multiplications and 4N-4 real additions
- 4N-2 real multiplications and 4N+2 real additions
- 4N real multiplications and 4N-2 real additions

17. If we split the N point data sequence into two N/2 point data sequences f1(n) and f2(n) corresponding to the even numbered and odd numbered samples of x(n), then such an FFT algorithm is known as decimation-in-time algorithm. * 1 point

Mark only one oval.

- True
- False

18. The circular convolution of two sequences in time domain is equivalent * 1 point

Mark only one oval.

- Multiplication of DFTs of two sequences
- Summation of DFTs of two sequences
- Difference of DFTs of two sequences
- Square of multiplication of DFTs of two sequences

19. If X(k) is the N/2 point DFT of the sequence x(n), then what is the value of X(k+N/2)? * 1 point

Mark only one oval.

- F1(k)+F2(k)
- F1(k)-WN^k F2(k)
- F1(k)+WN^k F2(k)
- None of the mentioned

20. DFT is applied to * 1 point

Mark only one oval.

- Infinite sequences
- Finite discrete sequences
- Continuous infinite signals
- Continuous finite sequences

21. The total number of complex multiplications required to compute N point DFT by radix-2 FFT is? * 1 point

Mark only one oval.

- (N/2)log2N
- Nlog2N
- (N/2)logN
- None of the mentioned

22. The direct form II for realisation involves 1) The realisation of transfer function into two parts 2) Realisation after fraction 3) Product of two transfer functions 4) Addition of two transfer functions * 1 point

Mark only one oval.

- 1, 2 and 3 are correct
- 1 and 3 are correct
- 3 and 4 are correct
- All the four are correct

23. For a decimation-in-time FFT algorithm, which of the following is true? * 1 point

Mark only one oval.

- Both input and output are in order
- Both input and output are shuffled
- Input is shuffled and output is in order
- Input is in order and output is shuffled

24. FIR filters _____ A. are non-recursive B. do not adopt any feedback C. are recursive D. use feedback * 1 point

Mark only one oval.

- A,B
- B,C
- C,D
- A,D

25. How many complex additions are required to be performed in linear filtering of a sequence using FFT algorithm? * 1 point

Mark only one oval.

- (N/2)logN
- 2Nlog2N
- (N/2)log2N
- Nlog2N

26. Which of the following is used in the realization of a system? * 1 point

Mark only one oval.

- Delay elements
- Multipliers
- Adders
- All of the mentioned

27. If the signal to be analyzed is an analog signal, we would pass it through an anti-aliasing filter with B as the bandwidth of the filtered signal and then the signal is sampled at a rate _____ * 1 point

Mark only one oval.

- Fs ≤ 2B
- Fs ≥ 2B
- Fs = 2B
- Fs ≥ B

28. The Nth rot of unity WN is given as _____ * 1 point

Mark only one oval.

- e^j2πN
- e^-j2πN
- e^-j2π/N
- e^j2π/N

29. If X(k) is the N point DFT of a sequence whose Fourier series coefficients is given by ck, then which of the following is true? * 1 point

Mark only one oval.

- X(k)=Nck
- X(k)=ck/N
- X(k)=N/ck
- None of the above

30. If W4^100=Wx^200, then what is the value of x? * 1 point

Mark only one oval.

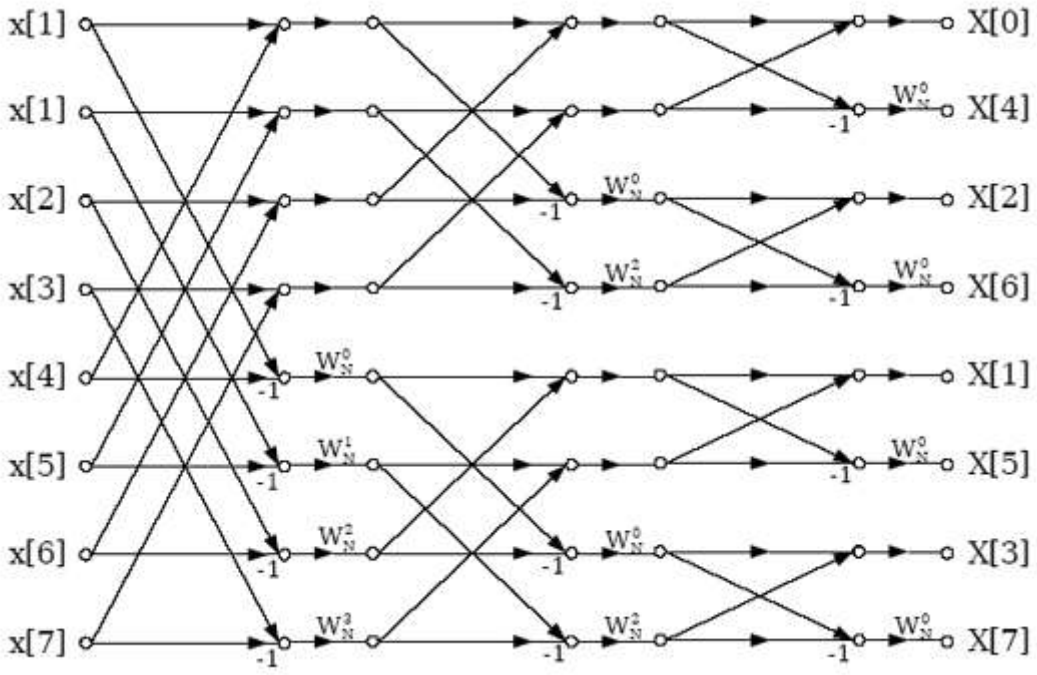
- 2
- 4
- 8
- 16

31. If X1(k) and X2(k) are the N-point DFTs of X1(n) and x2(n) respectively, then what is the N-point DFT of x(n)=ax1(n)+bx2(n)? * 1 point

Mark only one oval.

- X1(ak)+X2(bk)
- aX1(k)+bX2(k)
- e^ak.X1(k)+e^bk.X2(k)
- None of the above

32. The following butterfly diagram is used in the computation of _____ * 1 point



Mark only one oval.

- Decimation-in-time FFT
- Decimation-in-frequency FFT
- Can be used for both types
- None of the mentioned

33. If M and N are the orders of numerator and denominator of rational system function respectively, then how many multiplications are required in direct form-I realization of that IIR filter? * 1 point

Mark only one oval.

- M+N-1
- M+N
- M+N+1
- M+N+2

34. If M and N are the orders of numerator and denominator of rational system function respectively, then how many additions are required in direct form-I realization of that IIR filter? * 1 point

Mark only one oval.

- M+N-1
- M+N
- M+N+1
- M+N+2

Part - B and C

Part - B and C

35. 1. What are the applications of FFT algorithm? *

36. 2.Find the DFT of sequence x (n) = {1, 1, 0, 0}. *

37. 3.Define twiddle factor and write its magnitude & phase. *

38. 4.Why it is required to do zero padding in DFT Analysis? *

39. 5.List the Realization forms of IIR filter. *

40. 6. a) Using 8 point Radix-2 DIT-FFT Algorithm, find the DFT of sequence x(n)= {1,2,1,2,1,2,1,2}. OR 6)b) (i) Determine the output y (n) if h (n) = {1, 1, 1}, x (n) = {1, 2, 3, 1} by using Linear Convolution (6)(b) (ii) i. Realize 2nd order digital filter y(n)=2rcosθ y(n-1) −2r y(n-2)+x(n)-rcosθ x(n-1) in Direct Form I Realization

    Files submitted:

EI8075 - Fiber Optics and Laser Instruments

Internal Assessment Test - 1

The respondent's email (**null**) was recorded on submission of this form.
*Required

1. Email *

2. Batch Number *

3. Year / Section *

Skip to question 4

Quiz

EI8075 - Fiber Optics and Laser Instruments

4. The cladding in the optical fibers helps in which of the following: * 1 point

Mark only one oval.

- Light Transmission
- Mechanical Strength and protection
- Both A and B
- for Refraction

5. Total internal reflection relates to? * 1 point

Mark only one oval.

- The angle of the light reflecting in the core of the fiber
- The ability to hold in all light sources to speed up the data
- The bouncing back of the light within the fiber core.
- All of the Above

6. The core strand of an optical fiber can be made of what type of material? * 1 point

Mark only one oval.

- Copper
- Resin Gel
- Glass or Plastic
- Mica

7. Which color is most commonly used to indicate a regular multimode optical fiber? * 1 point

Mark only one oval.

- Black
- Orange
- Yellow
- Violet

8. What is the standard unit of measurement for optics' receive light levels? * 2 points

Mark only one oval.

- MB
- dBm
- V
- Lumens

9. Total internal reflection occurs when light enters from (Note : RI - Refractive Index) * 2 points

Mark only one oval.

- Low RI to High RI
- Materials having equal RI
- High RI to Low RI
- Cladding to core

10. The largest angle contained within the cone of acceptance is known as * 2 points

Mark only one oval.

- Acceptance Angle
- Numerical Aperture
- Critical Angle
- Cone Angle

11. If The difference in RI Values of core and cladding is 0.03, The signal will travel at a speed of * 2 points

Mark only one oval.

- 300 Kilometres per second
- 300 Kilometers per minute
- 15000 Kilometres per minute
- 1500 kilometres per minute

12. _____ refers to the spreading of light pulses until they overlap one another, and the data signal is distorted and lost. * 1 point

Mark only one oval.

- Cross-talk
- Refraction
- Scattering
- Dispersion

13. The range of signal frequencies or bit rate at which a fiber system can operate * 2 points

Mark only one oval.

- Bandwidth
- Spectrum
- Both A and B
- Gain

14. Optical fibers function well for signal transmission because of the principle of _____: * 1 point

Mark only one oval.

- Total internal Dispersion
- Total internal Diffraction
- Total internal Reflection
- Total internal Refraction

15. Light transmitted in fiber optic cables will be in which of the following region of the wavelength spectrum: * 2 points

Mark only one oval.

- Radio wave
- Visible region
- Ultra-violet
- Infrared

16. Water Peaks occur at * 2 points

Mark only one oval.

- 1360 nm
- 1560 nm
- 1500 nm
- 1400 nm

17. In _____, the scattered particles are equal to wavelength of the light. * 2 points

Mark only one oval.

- Stimulated Raman scattering
- Rayleigh Scattering
- Mie Scattering
- Stimulated Brillouin Scattering

18. Change in the refractive index of a material in response to an applied electric field * 1 point

Mark only one oval.

- Snell Effet
- quadratic electro-optic effect
- Kerr Effect
- Both B and C

19. If a light travels in a certain medium and it gets reflected off an optically denser medium with high refractive index, then it is regarded as * 2 points

Mark only one oval.

- Internal Relection
- Refraction
- External Reflection
- none of these

20. In Kerr effect, induced index change has its proportionality with respect to * 1 point

Mark only one oval.

- cube of electric field
- square of electric field
- square root of electric field
- one-fourth power of electric field

21. Alignment and locking of broken fiber edges by means of positioning devices & optical cement * 1 point

Mark only one oval.

- Fusion splice
- mechnical splice
- both A and B
- optical Terminator

22. _____ rays exhibit the variation in the light acceptability ability of the fiber? * 1 point

Mark only one oval.

- Meridional
- Leaky
- Skew
- all of the above

23. Which is the correct order of sequential steps for an electric arc fusion technique? A. Pressing of fiber ends for fusion B. Application of heat for smoothening of end-surfaces C. Alignment of broken fiber edges * 2 points

Mark only one oval.

- A,B,C
- B,A,C
- C,A,B
- C,B,A

24. _____ scattering occurs due to interaction of light in a medium with time dependent optical density variations thereby resulting into the change of energy (frequency) & path? * 2 points

Mark only one oval.

- Stimulated Brilliouin Scattering (SBS)
- Stimulated Raman Scattering (SRS)
- Rayleigh Scattering
- Mie Scattering

25. If a fiber optic cable is used as as a transducer, then it is called as * 2 points

Mark only one oval.

- Optical Sensor
- Extrinsic Sensor
- Intrinsic Sensor
- None of the Above

26. Conversion of phase to intensity is called as * 2 points

Mark only one oval.

- Displacement
- Interferometry
- Reflectometry
- Polarization

27. Attenuation of Fiber optics is measured by * 2 points

Mark only one oval.

- Intrinsic Sensor
- Reflectometer
- Cut Back Method
- Attenuator

28. Method used to calculate the joint losses in Fiber optic cable is _____ * 2 points

Mark only one oval.

- cut back method
- Reflectometry
- Both Scatter Method
- Interferometer

29. Repeated stress experienced by fiber optics in a duct is due to * 2 points

Mark only one oval.

- dynamic fatigue
- Static fatigue
- Attenuation
- Joint losses

30. Core diameter is high in * 2 points

Mark only one oval.

- Single mode fiber
- Graded index fiber
- Step index fiber
- Plastic fiber

31. OTDR stands for * 2 points

Mark only one oval.

- Optical transfer data rate
- Optical time data register
- Optical transfer domain reflectometer
- Optical time domain reflectometer

32. Total internal reflection takes place if the light ray strikes the interface at _____ critical angle? * 2 points

Mark only one oval.

- Less than
- Greater than
- equal to
- zero

33. The wavelength of visible light extends from * 2 points

Mark only one oval.

- 0.8 to 1.0 nm
- 200 to 660 nm
- 700 to 1200 nm
- 400 to 750 nm

IA TEST III- EI8075 FOLI

*Required

1. Email *

2. Name of the Student *

3. Batch Number *

4. Year and Section *

Mark only one oval.

- IV Year A
- IV Year B

PART -A

Answer All Questions

5. What is the full form of LASER? * 1 point

Mark only one oval.

- a) Light Absorbent and Stimulated Emission of Radiations
- b) Light Absorbing Solar Energy Resource
- c) Light Amplification by Stimulated Emission of Radiations
- d) Light Amplification of Singular Emission of Radiations

6. What determines the color of light? * 1 point

Mark only one oval.

- a) its intensity
- b) its wavelength
- c) its source
- Number of Photons

7. Which scientist first came up with the idea of stimulated emission ? * 1 point

Mark only one oval.

- a) Alexander Graham Bell
- b) Isaac Newton
- c) Arthur Schalow
- d) Albert Einstein

8. Which laser is considered “eye safe”? * 1 point

Mark only one oval.

- a) Laser bar-code scanners
- b) The eximer laser
- c) Communications lasers

9. What type of laser is used in CD and DVD players? * 1 point

Mark only one oval.

- a) Semiconductor
- b) YAG
- c) Alexandrite
- He-Ne

10. Why are lasers used in “Laser Printers” * 1 point

Mark only one oval.

- a) They can be focused down to very small spot sizes for high resolution
- b) They are cheap
- c) They are impossible to damage
- All of the Above

11. Which color of light has the shortest wavelength ? * 1 point

Mark only one oval.

- a) Yellow
- b) Blue
- c) Red
- d) Green

12. What is the type of laser used most widely in industrial materials processing applications? * 1 point

Mark only one oval.

- a) Dye Laser
- b) YAG laser
- c) Ruby Laser
- d) Carbon Dioxide Laser

13. Chemical lasers use____ to produce their beams. * 1 point

Mark only one oval.

- a) Excessive amounts of electrical power
- b) Small amounts of electrical power
- c) No electrical power
- All of the Above

14. What type of laser could cause skin cancer if not used properly? * 1 point

Mark only one oval.

- a) Red semiconductor laser
- b) Blue semiconductor
- c) Eximer laser
- d) YAG laser

15. Laser is used in LIDAR for what purpose? * 1 point

Mark only one oval.

- a) High-Speed Photography
- b) Range finder
- c) Optical Carrier signal
- d) Drilling

16. The longitudinal modes of a gallium arsenide injection laser emitting at a wave length of 0.87μm are separated in frequency by 278 GHz. Determine the length of the optical cavity. The refractive index of gallium arsenide is 3.6. * 1 point

Mark only one oval.

- a) 100 microns
- b) 125 microns
- c) 150 microns
- d) 300 microns

17. For an ordinary light source, the coherence time t = 10^-10 s. The degree of Monochromaticity for a wavelength of 6000 Å is _____ * 1 point

Mark only one oval.

- a) 0.1 X 10-4
- b) 0.2 X 10-4
- c) 0.3 X 10-4
- d) 0.4 X 10-4

18. The output of a laser has pulse duration of 30 ms and average output power of 1 W per pulse. How much energy is released per pulse if wavelength is 6600 Å? * 1 point

Mark only one oval.

- a) 0.001 J
- b) 0.002 J
- c) 0.003 J
- d) 0.004 J

19. The Eximer laser produces light with what wavelength? * 1 point

Mark only one oval.

- a)Visible
- b)Ultraviolet
- c)Infrared
- d) Red

20. Which of the following processes does not use lasers? * 1 point

Mark only one oval.

- a) Cladding
- b) Alloying
- c) Nitriding
- d) Cutting

21. Laser causes a rapid substantial rise in _____ of the material * 1 point

Mark only one oval.

- a) local temperature
- b) local pressure
- c) indentation
- d) cracks

22. What is the material removal mechanism of Laser beam machining process? * 1 point

Mark only one oval.

- a) Melt and evaporate
- b) Electro chemical corrosion
- c) Mechanical erosion of materials
- d) Electro chemical dissolution

23. What happens when the heat is diffused into bulk material? * 1 point

Mark only one oval.

- a) Phase change occurs
- b) Melting occurs
- c) Vaporization may take place
- d) All of the mentioned

24. What happens to the material removal rate when reflectivity is higher? * 1 point

Mark only one oval.

- a) Will increase
- b) Will decrease
- c) Will enhance
- d) Remains same

25. Which of the following has high machining speeds in Laser Beam Machining? * 1 point

Mark only one oval.

- a) Metals
- b) Non metals
- c) Metal alloys
- d) All of the mentioned

26. Holography was discovered by * 1 point

Mark only one oval.

- Dennis Gabor
- Einstein
- Newton
- curie brothers

27. In holography interference pattern is produced from * 1 point

Mark only one oval.

- object beam
- reference beam
- both a and b
- none of the above

28. Through holography we can produce _____ dimensional images of objects. * 1 point

Mark only one oval.

- one
- two
- three
- none of the above

29. Which characteristic of LASER allows it to be used in holography? * 1 point

Mark only one oval.

- a) Coherency
- b) Directionality
- c) Intensity
- d) Monochromaticity

30. The technique by which image is obtained from a hologram is called as * 1 point

Mark only one oval.

- a) Formation
- b) Construction
- c) Reconstruction
- d) Projection

31. The principle of generation of the wavefront from an object from a hologram can be used for * 1 point

Mark only one oval.

- a) Data Storage
- b) Transient Microscopy
- c) Interferometry
- d) Pattern recognition

32. The laser procedure in eye, most often used for treating iris neovascularization, is: * 1 point

Mark only one oval.

- a) Goniophotocoagulation
- b) Laser trabeculoplasty
- c) Panretinal photocoagulation
- d) Laser iridoplasty

33. Removal of tissue fragments with Lasers, without damaging surrounding tissue, is done by the process of: * 1 point

Mark only one oval.

- a. Protein denaturation
- b. Coagulation
- c. Photoablation

34. Which medical application uses lasers? * 1 point

Mark only one oval.

- a. Computed Tomography
- b. Refractometry
- c. Magnetic resonance imaging

Answer All questions

PART B

35. Compare Holography with photography *

36. Write Conditions for Recording A Hologram *

37. Define Thermalisation *

38. Compare Conduction Limited Melting and Key Hole Melting *

39. Brief the types of Trims used in laser trimming of materials? *

40. Comment on the principle of distance measurement using laser *

41. Outline the semiconductor materials used for emission over the wave length range 0.8 to 1.7 μm and give reasons for their choice. *

42. What are the different types Laser levels *

43. List the types and Properties of laser *

44. Define Q-switching and mode locking *

FOLI MCQ

* Required

1. Email *

2. Name of the Student *

3. Batch Number *

4. Year / Sec *

Mark only one oval.

- IV Year A
- IV Year B

PART-A

30*1 = 30 Marks

5. In an optical fiber communication system, which among the following is not a typical transmitter function? 1 point

Mark only one oval.

- a. Coding for error protection
- b. Decoding of input data
- c. Electrical to optical conversion
- d. Recoding to match output standard

6. In an optical fiber, the concept of Numerical aperture is applicable in describing the ability of 1 point

Mark only one oval.

- a. Light Collection
- b. Light Scattering
- c. Light Dispersion
- d. Light Polarization

7. In Kerr effect, induced index change has its proportionality with respect to _____ 1 point

Mark only one oval.

- a. square of electric field
- b. cube of electric field
- c. cube root of electric field
- d. one-fourth power of electric field

8. Which among the following is regarded as an inelastic scattering of a photon? 1 point

Mark only one oval.

- a. Kerr Effect
- b. Raman Effect
- c. Hall Effect
- d. Miller Effect

9. Which is the correct order of sequential steps for an electric arc fusion technique? 1 point

A. Pressing of fiber ends for fusion
B. Application of heat for smoothening of end-surfaces
C. Alignment of broken fiber edges

Mark only one oval.

- a. A, B, C
- b. B, A, C
- c. C, B, A
- d. C, A, B

10. In the structure of a fiber, which component provides additional strength and prevents the fiber from any damage? 1 point

Mark only one oval.

- a. Core
- b. Cladding
- c. Buffer Coating
- d. None of the above

11. Which category/ies of wavelength division multiplexer comprise/s two 3dB couplers where the splitting of an incident beam takes place into two fiber paths, followed by the recombination with second 3-dB coupler? 1 point

Mark only one oval.

- A. Interference filter based devices
- B. Angular dispersion based devices
- C. Mach-Zehnder Interferometers
- D. All of the above

12. Which among the following controls the length of Fabry-Perot interferometer so that it can act as a tunable optical filter? 1 point

Mark only one oval.

- A. Transducer
- B. Tachometer
- C. Multimeter
- D. Phase-meter

13. In a laser structure, the existence of standing waves is possible at frequencies for which the distance between the mirrors is an integral number of _____ 1 point

Mark only one oval.

- A. λ / 8
- B. λ / 4
- C. λ / 6
- D. λ / 2

14. _____ dispersion is caused by the difference in the propagation times of light rays that take different paths down a fiber. 1 point

Mark only one oval.

- a. Material dispersion
- b. Wavelength dispersion
- c. Modal dispersion
- d. Delay dispersion

15. Consider the assertions/ characteristics given below. Which type of attenuation measurement technique exhibits these characteristics?1. Necessity of accessing both ends of fiber.2. Measurements corresponding to specific wavelengths.3. Requirement of spectral response over a range of wavelengths. 1 point

Mark only one oval.

- A. Cutback Technique
- B. Insertion Loss Technique
- C. Use of OTDR Technique
- D. None of the above

16. In Stimulated Absorption, what is the lifetime of atoms ground state? 1 point

Mark only one oval.

- a) 1 second
- b) 1 minute
- c) 1 hour
- d) Infinity

17. Which of the following is not a characteristic of LASERS? 1 point

Mark only one oval.

- a) Monochromatic
- b) Coherent
- c) Divergent
- d) Intense

18. Laser is used in LIDAR for what purpose? 1 point

Mark only one oval.

- a) High-Speed Photography
- b) Range finder
- c) Optical Carrier signal
- d) Drilling

19. Lasers are used for welding of wires because they can be focused onto a fine spot. 1 point

Mark only one oval.

- True
- False

20. Where is ND: YAG most commonly used? 1 point

Mark only one oval.

- a) Cosmetic Surgery
- b) Welding
- c) Photography
- d) Optical Communications

21. The information carrying capacity of laser is enormous due its large _____ 1 point

Mark only one oval.

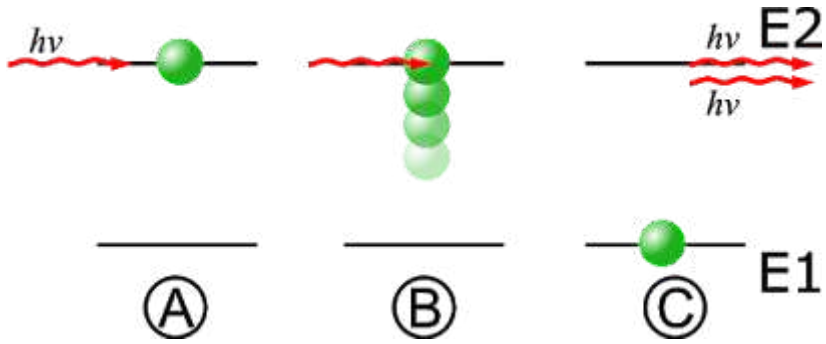
- a) Coherence
- b) Bandwidth
- c) Directionality
- d) Intensity

22. What is the region enclosed by the optical cavity called? 1 point

Mark only one oval.

- a) Optical Region
- b) Optical System
- c) Optical box
- d) Optical Resonator

23. The following graph is pictorial representation of _____ 1 point



Mark only one oval.

- a) Spontaneous emission
- b) Spontaneous Absorption
- c) Stimulated emission
- d) Stimulated Absorption

24. Which of the following is used to direct laser beam? 1 point

Mark only one oval.

- a) glass apertures
- b) perforated glass sheets
- c) flat optical elements
- d) electro-magnetic coils

25. In solid state laser _____ is used as a dopant. 1 point

Mark only one oval.

- a) actinium ion
- b) neodymium ion
- c) platinum ion
- d) lead ion

26. CO2 lasers employs gas mixture of _____ 1 point

Mark only one oval.

- a) nitrogen and helium
- b) hydrogen and helium
- c) argon and xenon
- d) oxygen and nitrogen

27. Which of the following processes does not use lasers? 1 point

Mark only one oval.

- a) Cladding
- b) Alloying
- c) Nitriding
- d) Cutting

28. Laser beams can have power density upto _____ 1 point

Mark only one oval.

- a) 1 kW/mm2
- b) 10 kW/mm2
- c) 1 MW/mm2
- d) 10 MW/mm2

29. The technique by which image is obtained from a hologram is called as _____ 1 point

Mark only one oval.

- a) Formation
- b) Construction
- c) Reconstruction
- d) Projection

30. The information in the hologram exists in _____ 1 point

Mark only one oval.

- a) Colored Image form
- b) Black and white image form
- c) 3-D image form
- d) Coded form

31. Which of the following is an example of optical pumping? 1 point

Mark only one oval.

- a) Ruby laser
- b) Helium-Neon laser
- c) Semiconductor laser
- d) Dye laser

32. Which medical application uses lasers? 1 point

Mark only one oval.

- a. Magnetic resonance imaging
- b. Refractometry
- c. Computed Tomography

33. Removal of tissue fragments with Lasers, without damaging surrounding tissue, is done by the process of 1 point

Mark only one oval.

- a. Protein denaturation
- b. Coagulation
- c. Photoablation

34. The laser procedure in eye, most often used for treating iris neovascularization, is: 1 point

Mark only one oval.

- a) Goniophotocoagulation
- b) Laser trabeculoplasty
- c) Panretinal photocoagulation
- d) Laser iridoplasty

PART-B

15*2 = 30 Marks

35. The output of a laser has pulse duration of 30 ms and average output power of 1 W per pulse. How much energy is released per pulse if wavelength is 6600 Å? 2 points

Mark only one oval.

- a) 0.001 J
- b) 0.002 J
- c) 0.003 J
- d) 0.004 J

36. For an ordinary light source, the coherence time t = 10^-10 s. The degree of Monochromaticity for a wavelength of 6000 Å is _____ 2 points

Mark only one oval.

- a) 0.1 X 10^-4
- b) 0.2 X 10^-4
- c) 0.3 X 10^-4
- d) 0.4 X 10^-4

37. The longitudinal modes of a gallium arsenide injection laser emitting at a wave length of 0.87μm are separated in frequency by 278 GHz. Determine the length of the optical cavity. The refractive index of gallium arsenide is 3.6. 2 points

Mark only one oval.

- a) 100 microns
- b) 125 microns
- c) 150 microns
- d) 300 microns

38. If a fiber operates at 1400nm with the diameter of about 10 μm, n1 = 1.30, Δ = 0.80% , V = 3.5, then how many modes will it have? 2 points

Mark only one oval.

- a. 6.125
- b. 9.655
- c. 12.95
- d. 16.55

39. For a photo-diode with responsivity of 0.50 A/W & optical power of about 12μW, what would be the value of generated photocurrent? 2 points

Mark only one oval.

- a. 3 μA
- b. 6 μA
- c. 9 μA
- d. 12 μA

40. Assuming no ISI, the maximum possible bandwidth of a multimode graded index fiber with 5 MHz, shows the total pulse broadening of 0.1s for the distance of about 12km. What would be the value of bandwidth length product? 2 points

Mark only one oval.

- a. 40 MHz
- b. 60 MHz
- c. 90 MHz
- d. 120 MHz

41. Fiber-optic cables with attenuations of 1.8, 3.4, 5.9, and 18 dB are linked together. The total loss is 2 points

Mark only one oval.

- a. 7.5 dB
- b. 19.8 dB
- c. 29.1 dB
- d. 650 dB

42. Consider a crystal of ruby laser whose length is 6 cm and the refractive index is 1.8, emits the wavelength of about 0.55 μm. What will be the value of number of longitudinal modes? 2 points

Mark only one oval.

- A. 3.9 x 105
- B. 4.9 x 105
- C. 5.6 x 105
- D. 7.7 x 105

43. If a noisy channel has a bandwidth of 4 MHz with signal to noise ratio of about 1, what would be the maximum capacity of the channel? 2 points

Mark only one oval.

- A. 2 Mb/sec
- B. 4 Mb/sec
- C. 6 Mb/sec
- D. 8 Mb/sec

44. Laser light from a 2mW source of aperture diameter 1.5 cm and wavelength 5000 Å is focused by a lens of focal length 20 cm. The intensity of the image is _____ 2 points

Mark only one oval.

- a) 1.57 X 10^6 Wm-2
- b) 2.57 X 10^6 Wm-2
- c) 3.57 X 10^6 Wm-2
- d) 4.57 X 10^6 Wm-2

45. The laser frequency when the light has the wavelength 800 nm is 2 points

Mark only one oval.

- a. 375 x 10^12 Hz
- b. 475 x 10^15 Hz
- c. 375 x 10^9 Hz
- d. 375 x 10^18 Hz

46. The numerical aperture of a fiber if the angle of acceptance is 15 degrees, is 2 points

Mark only one oval.

- a. 017
- b. 0.26
- c. 0.50
- d. 0.75

47. A positive lens with a focal length of 10 cm forms a real image of an object 20 cm away from the lens. How far is the real image from the lens? 2 points

Mark only one oval.

- a. 5 cm
- b. 10 cm
- c. 15 cm
- d. 20 cm

48. What is the photon energy for an infrared wave with frequency of 10^12 Hz? 2 points

Mark only one oval.

- a. 10.6 x 10^34 joules
- b. 6.63 x 10^-34 joules
- c. 6.63 x 10^-22 joules
- d. 10.6 x 10^22 joules

49. What is the insertion loss of connector-type splices for a single mode fiber optics? 2 points

Mark only one oval.

- a. 0.51 dB
- b. 0.31 dB
- c. 0.49 dB
- d. 0.38 dB

2nd Model Exam- EI8075 FOLI

*Required

1. Email *

2. Name of the Student *

3. Batch Number *

4. Year / Sec *

Mark only one oval.

- IV Year A
- IV Year B

PART-A

30*1 = 30 Marks

5. Which among the following is provided by an optical receiver for the regeneration of data signal with minimum error? 1 point

Mark only one oval.

- a. Photo-diode
- b. Signal Processing Circuits
- c. Linear Circuitry
- d. None of the above

6. Which feature of an eye-diagram assists in the measurement of additive noise in the signal? 1 point

Mark only one oval.

- a. Eye opening (height, peak to peak)
- b. Eye overshoot/ undershoot
- c. Eye width
- d. None of the above

7. Which property/ies of PCM stream determine/s the fidelity to original analog signal? 1 point

Mark only one oval.

- a. Sampling rate
- b. Bit depth
- c. Both a and b
- d. None of the above

8. Which method determines the dispersion limitation of an optical link? 1 point

Mark only one oval.

- a. Link power budget
- b. Rise time budget
- c. Both a and b
- d. None of the above

9. What is the typical value of refractive index for an ethyl alcohol? 1 point

Mark only one oval.

- a. 1
- b. 1.36
- c. 2.6
- d. 3.4

10. Speckle pattern is generated due to interference of nodes from a coherent source especially when the coherence time of source is _____ the intermodal dispersion time in the fiber. 1 point

Mark only one oval.

- a. Less than
- b. Greater than
- c. Equal to
- Option 4

11. If a light travels in a certain medium and it gets reflected off an optically denser medium with high refractive index, then it is regarded as _____ 1 point

Mark only one oval.

- a. External Reflection
- b. Internal Reflection
- c. Both a and b
- d. None of the above

12. From the tests carried out in fiber characterization, which among the following measures the total light reflected back to the transmitter caused by the fiber as well as the components like connector pairs and mechanical splices? 1 point

Mark only one oval.

- a. ORL
- b. OTDR
- c. LTS
- d. PMD

13. In a laser structure, the existence of standing waves is possible at frequencies for which the distance between the mirrors is an integral number of _____ 1 point

Mark only one oval.

- A. λ / 8
- B. λ / 4
- C. λ / 6
- D. λ / 2

14. In multifiber cable system, which form of outer jacket/s consist/s of polyolefin compounds and are regarded as halogen free? 1 point

Mark only one oval.

- a. OFNR
- b. OFNP
- c. LSZH
- d. All of the above

15. Consider the assertions/ characteristics given below. Which type of attenuation measurement technique exhibits these characteristics?1. Necessity of accessing both ends of fiber.2. Measurements corresponding to specific wavelengths.3. Requirement of spectral response over a range of wavelengths. 1 point

Mark only one oval.

- A. Cutback Technique
- B. Insertion Loss Technique
- C. Use of OTDR Technique
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16. In Stimulated Absorption, what is the lifetime of atoms ground state? 1 point

Mark only one oval.

- a) 1 second
- b) 1 minute
- c) 1 hour
- d) Infinity

17. Is the different angle of entry of light into an optical fiber when the diameter of the core is many times the wavelength of the light transmitted. 1 point

Mark only one oval.

- a. Acceptance angle
- c. Sensors
- d. Aperture
- b. Modes

18. Laser is used in LIDAR for what purpose? 1 point

Mark only one oval.

- a) High-Speed Photography
- b) Range finder
- c) Optical Carrier signal
- d) Drilling

19. . Is the width of the range of wavelengths emitted by the light source 1 point

Mark only one oval.

- a. Bandwidth
- b. Chromatic Dispersion
- c. Spectral width
- d. Beamwidth

20. Where is ND: YAG most commonly used? 1 point

Mark only one oval.

- a) Cosmetic Surgery
- b) Welding
- c) Photography
- d) Optical Communications

21. Which theory states that the light wave behaves as if it consists of many tiny particles? 1 point

Mark only one oval.

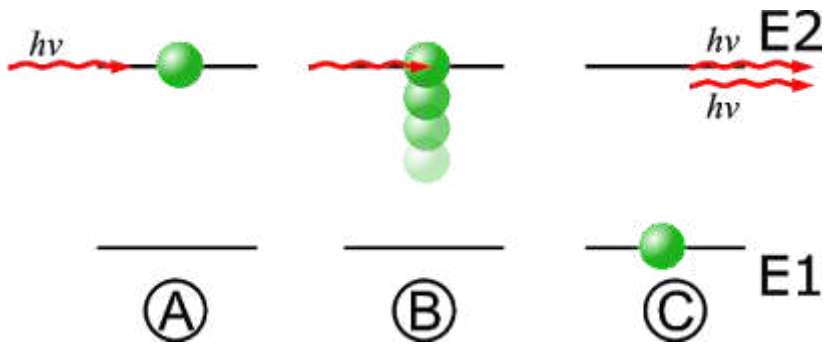
- a. Huygen's theory
- b. Wave theory of light
- c. Nyquist theory
- d. Quantum theory

22. When a beam of light enters one medium from another, which quantity will not change? 1 point

Mark only one oval.

- a. Direction
- b. Speed
- c. Frequency
- d. Wavelength

23. The following graph is pictorial representation of _____ 1 point



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24. Which of the following is used to direct laser beam? 1 point

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- a) glass apertures
- b) perforated glass sheets
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- d) electro-magnetic coils

25. In solid state laser _____ is used as a dopant. 1 point

Mark only one oval.

- a) actinium ion
- b) neodymium ion
- c) platinum ion
- d) lead ion

26. Dispersion is used to describe the 1 point

Mark only one oval.

- a. Splitting of white light into its component colors
- b. Propagation of light in straight lines
- c. Bending of a beam of light when it goes from one medium to another
- d. Bending of a beam light when it strikes a mirror

27. Which of the following processes does not use lasers? 1 point

Mark only one oval.

- a) Cladding
- b) Alloying
- c) Nitriding
- d) Cutting

28. Luminance efficiency is minimum for a 1 point

Mark only one oval.

- a. Fluorescent tube
- b. High wattage light bulb
- c. Mercury vapor lamp
- d. Low wattage light bulb

29. The technique by which image is obtained from a hologram is called as _____ 1 point

Mark only one oval.

- a) Formation
- b) Construction
- c) Reconstruction
- d) Projection

30. The wavelength of light has no role in 1 point

Mark only one oval.

- a. Diffraction
- b. Interference
- c. Polarization
- d. Reflection

31. Which of the following is an example of optical pumping? 1 point

Mark only one oval.

- a) Ruby laser
- b) Helium-Neon laser
- c) Semiconductor laser
- d) Dye laser

32. For a photo-diode with responsivity of 0.50 A/W & optical power of about 12μW, what would be the value of generated photocurrent? 1 point

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- a. 3 μA
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- c. 9 μA
- d. 12 μA

33. Removal of tissue fragments with Lasers, without damaging surrounding tissue, is done by the process of 1 point

Mark only one oval.

- a. Protein denaturation
- b. Coagulation
- c. Photoablation

34. What is the lifetime of LEDs? 1 point

Mark only one oval.

- a. 200,000 minutes
- b. 200,000 hours
- c. 150,000 minutes
- d. 150,000 hours

PART-B

15*2 = 30 Marks

35. The output of a laser has pulse duration of 30 ms and average output power of 1 W per pulse. How much energy is released per pulse if wavelength is 6600 Å? 2 points

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Mark only one oval.

- a. 6.125
- b. 9.655
- c. 12.95
- d. 16.55

39. Which component of an optical receiver is a linear frequency shaping filter used for the compensation of signal distortion and Inter Symbol Interference (ISI)? 2 points

Mark only one oval.

- a. Photodetector
- b. Amplifier
- c. Equalizer
- d. None of the above

40. Assuming no ISI, the maximum possible bandwidth of a multimode graded index fiber with 5 MHz, shows the total pulse broadening of 0.1s for the distance of about 12km. What would be the value of bandwidth length product? 2 points

Mark only one oval.

- a. 40 MHz
- b. 60 MHz
- c. 90 MHz
- d. 120 MHz

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Mark only one oval.

- a. 7.5 dB
- b. 19.8 dB
- c. 29.1 dB
- d. 650 dB

42. Consider a crystal of ruby laser whose length is 6 cm and the refractive index is 1.8, emits the wavelength of about 0.55 μm. What will be the value of number of longitudinal modes? 2 points

Mark only one oval.

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- B. 4.9 x 105
- C. 5.6 x 105
- D. 7.7 x 105

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- D. 8 Mb/sec

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Mark only one oval.

- a) 1.57 X 10^6 Wm-2
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- c) 3.57 X 10^6 Wm-2
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45. The laser frequency when the light has the wavelength 800 nm is 2 points

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- c. 375 x 10^9 Hz
- d. 375 x 10^18 Hz

46. The numerical aperture of a fiber if the angle of acceptance is 15 degrees, is 2 points

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- b. 0.26
- c. 0.50
- d. 0.75

47. A positive lens with a focal length of 10 cm forms a real image of an object 20 cm away from the lens. How far is the real image from the lens? 2 points

Mark only one oval.

- a. 5 cm
- b. 10 cm
- c. 15 cm
- d. 20 cm

48. What is the photon energy for an infrared wave with frequency of 10^12 Hz? 2 points

Mark only one oval.

- a. 10.6 x 10^34 joules
- b. 6.63 x 10^-34 joules
- c. 6.63 x 10^-22 joules
- d. 10.6 x 10^22 joules

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- a. 0.51 dB
- b. 0.31 dB
- c. 0.49 dB
- d. 0.38 dB

Saranathan College of Engineering

Tiruchirappalli

Internal Assessment Test – I			Date/ Session	12/09/2020 & AN	Marks	50
Course code	EC8353	Course Title	Electron Devices and Circuits			
Batch No.		Duration	90 mins	Academic Year	2020-2021/ ODD	
Year	II	Semester/ Section	III / A & B	Department	EEE	

Part – A (20 Marks)

I. Choose the correct answer for the following Questions **(10 x 1 = 10marks)**

Q. No.	Questions	CO	Skills
1.(a)	In an unbiased PN junction diode _____ will occur. a)Diffusion b) Depletion region c) Barrier Potential d) All the above	C205.1	U
1.(b)	The voltage at which the depletion region disappears during forward bias is called _____		U
2.(a)	In LED, the energy released in the form light depends on _____ a) Majority carriers b) Minority carriers c) Forbidden energy gap d) immobile charges	C205.1	R
2.(b)	The LED glows in red/green colour when the material is _____ a) Gallium Phosphide b) Gallium Arsenide c) Gallium Arsenide Phosphide d) Gallium		R
3.(a)	Find the voltage at which the reverse current in a Ge PN diode attains a value of 90% of its saturation current at room temperature is _____	C205.1	AZ
3.(b)	The term LASER stands for _____		R
4.(a)	The capacitance that exists in forward bias junction is called as transition capacitance – True / False.	C205.1	R
4.(b)	In a Full wave rectifier, the ripple frequency of the output is twice that of fundamental frequency – True / False.		R
5.(a)	Bipolar junction transistor is a _____ device. a)Voltage control b) Power control c) current control d) Voltage regulator	C205.2	U
5.(b)	The emitter region of a transistor is ____ doped and the area is _____ than collector region. a)Lightly , larger b) Lightly, smaller c) Heavily ,Smaller d) Heavily doped, greater		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	Comparison between PN diode and Zener Diode.	C205.1	U
7	List the application of LED.	C205.1	R
8	A silicon diode has a saturation current of 7.5 μA at 300K.Find the saturation current at 400K.	C205.1	AZ
9	Define Voltage Regulation.	C205.1	U
10	Calculate α and β of a given transistor for which IC = 5mA,IB = 50μA & ICbo =1μA.	C205.2	AZ

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(i) Explain the VI characteristics of PN junction diode. (6) (ii) Distinguish between Avalanche breakdown and Zener breakdown. (4)	C205.1	U
	Or		
12	(i) Derive the expression for diffusion capacitance of PN junction diode. (6). (ii) Determine the minimum and maximum load current for which the zener diode will maintain regulation. What is the minimum load resistance that can be used when zener voltage is 10V , minimum Zener current of 5mA,maximum zener current of 25mA and zener resistance of zero ohm. (4)	C205.1	U,AZ

13	Explain the working of centre tapped Full wave rectifier and derive the expression for ripple factor, Voltage, current, efficiency.	C205.1	U
	Or		
14	An AC supply of 220V, 50Hz is applied to a half wave rectifier through a transformer of turns ratio 10:1. Assume the diode is ideal and Load resistance is 100Ω.Find (i) Maximum RMS DC Values of load voltage, (ii) Maximum RMS DC value of load current,(iii) Efficiency .	C205.1	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the Characteristics of Common Base configuration of a transistor with a neat diagram.	C205.2	U
	Or		
16	Explain the Input and output characteristics of CE configuration of a transistor with a neat diagram.	C205.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE & Mr.R.Sridhar AP/EEE

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test – I			Date/Session	11.09.2020 (FN)	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	1 ½ hours	Academic Year	2020-2021/ODD	
Year	II	Semester	03	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	The representation of octal number (45.23)8 in decimal is ___ a) (34.254)10 b) (53.863)10 c) (34.672)10 d) (37.296.16)10	C202.1	R
1.(b)	The decimal equivalent of the binary number (1101.101)2 is _____ a) (11.375)10 b) (10.123)10 c) (13.515)10 d) (12.123)10		R
2.(a)	The largest two digit hexadecimal number is _____ a) (FE)16 b) (FF)16 c) (FD)16 d) (EF)16	C202.1	R
2.(b)	The given hexadecimal number (3E.23)16 is equivalent to _____ a) (76.106)8 b) (66.246)8 c) (44.340)8 d) (55.577)8		R
3.(a)	The octal number (152.346)8 is equivalent to _____ a) (1E.2A)16 b) (1B.10)16 c) (5A.A3)16 d) (6A.73)16	C202.1	R
3.(b)	The octal equivalent of the decimal number (324)10 is _____ a) (641)8 b) (619)8 c) (504)8 d) (598)8		R
4.(a)	Convert the hexadecimal number (1C2)16 to decimal: a) 480 b) 450 c) 482 d) 484	C202.1	R
4.(b)	Convert (0.234)10 into an octal number: a) (0.167)8 b) (0.260)8 c) (0.194)8 d) (0.240)8		R

5.(a)	Convert the binary number (01011.1011)2 into octal: a) (11.68)10 b) (11.58)10 c) (10.98)10 d) (23.54)10	C202.1	R
5.(b)	Octal to binary conversion: (47)8 =? a) (111101)2 b) (010100)2 c) (100111)2 d) (101010)2		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	State DeMorgan's theorem	C202.2	U
7	State Distributive law	C202.2	U
8	Convert given SOP into Canonical SOP: AB + B'C + A'C	C202.2	A
9	Simplify using K-map : ∑m(0,1,3,4,5,7)	C202.2	A
10	Simplify the expression using Boolean algebra A'B'C' + A'BC' + A'BC	C202.2	A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	i. Encode the binary word 1011 into 7 bit even parity hamming code ii. The Hamming code 101101101 is received, correct it if any errors. Use odd parity and also find the original information.	C202.1	AZ
	Or		
12	i. Perform BCD Addition : 86 + 97 ii. Perform Excess – 3 addition : 26 + 15 iii. Perform 2's Complement subtraction : 23-34	C202.1	AZ
13	Simplify using K-map :f(w,x,y,z) = ∑m(0,7,8,9,10,12) + ∑d(2,5,13)	C202.2	AZ
	Or		
14	Simplify using K-map :F(A,B,C,D) = πM(0,2,3,8,9,12,13,15)	C202.2	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Design BCD to Gray code converter and implement it using Logic gates.	C202.2	AZ
	Or		
16	Simplify the following expression using Boolean algebra i. X+XYZ+X'YZ+WX+W'X+X'Y ii. AB+(AC)'+AB'C(AB+C) iii. (AB'+C+D')'	C202.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Ms.A.R.Danila Shirly & Dr.S.Vijayalakshmi

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test – I			Date/Session		Marks	50
Course code	EE8551	Course Title	Microprocessor & Microcontroller			
Batch No.		Duration	1 ½ hours	Academic Year	2021-2022/ODD	
Year	III	Semester	05	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.	Classify the types of 8085 flags.	C302.1	A
2.	**Mention the uses of ALE in 8085 Microprocessor**	C302.1	U
3.	State any four pins of 8085 Microprocessor which are used to generate control and status signals	C302.1	U
4.	List out the machine cycle for executing the instruction MVI B,89 & LDA 8000	C302.1	U
5.	Define address bus and Data bus	C302.1	R
6.	Discuss the function of CALL instruction	C302.2	U
7.	Give examples for one byte, two byte and three byte instructions.	C302.2	U
8.	Explain the operation of MOV B, FE & MVI B,05	C302.2	U
9.	Differentiate MVI, and MOV instruction	C302.2	U
10.	Explain one Rotate instruction with one example	C302.2	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Draw and explain the architecture of 8085.	C302.1	AZ
	Or		
12	Briefly explain about the interrupts in 8085	C302.1	AZ
13	Briefly explain the Pin out details of 8085	C302.2	AZ
	Or		
14	Draw the timing diagram for the instruction IN 3C	C302.2	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Short notes on various addressing modes in 8085 with suitable example.	C302.2	AZ
	Or		
16	Explain any 10 data transfer instructions in 8085 with suitable example.	C302.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.M.Marimuthu & Dr.S.Vijayalakshmi

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test – II			Date/Session	05.10.2020 (AN)	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	1 ½ hours	Academic Year	2020-2021/ODD	
Year	II	Semester	03	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	In which operation carry is obtained? a) Subtraction b) Addition c) Multiplication d) Both addition and subtraction	C202.2	R
1.(b)	If A and B are the inputs of a half adder, the sum is given by _____ a) A AND B b) A OR B c) A XOR B d) A EX-NOR B		R
2.(a)	The difference between half adder and full adder is _____ a) Half adder has two inputs while full adder has four inputs b) Half adder has one output while full adder has two outputs c) Half adder has two inputs while full adder has three inputs d) All of the Mentioned	C202.2	R
2.(b)	If A, B and C are the inputs of a full adder then the carry is given by _____ a) A AND B OR (A OR B) AND C b) A OR B OR (A AND B) C c) (A AND B) OR (A AND B)C d) A XOR B XOR (A XOR B) AND C		R
3.(a)	Let A and B is the input of a subtractor then the borrow will be _____ a) A AND B' b) A' AND B c) A OR B d) A AND B	C202.2	R
3.(b)	What is a multiplexer? a) It is a type of decoder which decodes several inputs and gives one output b) A multiplexer is a device which converts many signals into one c) It takes one input and results into many output d) It is a type of encoder which decodes several inputs and gives one output		R
4.(a)	The truth table for an S-R flip-flop has how many VALID entries? a) 1 b) 2 c) 3 d) 4	C202.3	R
4.(b)	Which of the following is correct for a gated D-type flip-flop? a) The Q output is either SET or RESET as soon as the D input goes HIGH or LOW b) The output complement follows the input when enabled c) Only one of the inputs can be HIGH at a time d) The output toggles if one of the inputs is held HIGH		R
5.(a)	The logic circuits whose outputs at any instant of time depends only on the present input but also on the past outputs are called a) Combinational circuits b) Sequential circuits c) Latches d) Flip-flops	C202.3	R
5.(b)	In S-R flip-flop, if Q = 0 the output is said to be _____ a) Set b) Reset c) Previous state d) Current state		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	Design a half Subtractor.	C202.2	U
7	Draw the logical diagram of EX-OR gate using NAND gates	C202.2	U
8	What are encoders?	C202.2	A
9	Express the Characteristic equation of SR-FF	C202.3	A
10	Convert JK Flip-flop into D-FF	C202.3	A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	a. Design Full Adder circuit using logic gates. Also design full adder using two half adder. (8) b. Draw 1:4 Demux (2)	C202.2	AZ
	Or		
12	Short notes on 1. Multiplexer 2. Priority Encoder	C202.2	AZ
13	1. Design Two-bit Magnitude comparator 2. **Implement the equation using only NAND gates** **a.** *Y □ BC □ AB □ AD* *b.* ***F = (x + y) z***	C202.2	AZ
	Or		
14	Design a Seven segment Decoder and implement using logic gates	C202.2	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Design JKMS - FF and explain the operation using Truth table and waveforms	C202.3	AZ
	Or		
16	Short notes on Shift registers	C202.3	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Ms.A.R.Danila Shirly & Dr.S.Vijayalakshmi

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test – II			Date/Session	05.02.2020 (AN)	Marks	50
Course code	EE8551	**Course Title**	Microprocessor & Microcontroller			
Batch No.		**Duration**	1 ½ hours	**Academic Year**	2020-2021/ODD	
Year	III	**Semester**	05	**Department**	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	In which of these modes, the immediate operand is included in the instruction itself? a) register operand mode b) immediate operand mode c) register and immediate operand mode d) none of the mentioned	C302.2	R
1.(b)	Which of the following addressing technique not used in the 8085 Microprocessor? a. Immediate b. Relative c. Direct d. Indirect		R
2.(a)	Which one of the following statements is correct regarding CMP A? a. Compare accumulator with Register A b. Compare accumulator with Memory c. Compare accumulator with H d. This instruction does not exist	C302.2	R
2.(b)	Which one is a 16-bit register for 8085 Microprocessor? a. Register B b. Register C c. Accumulator d. Stack pointer		R
3.(a)	Which minimum mode signal is used for demultiplexing the data and address lines with the assistance of an external latch in a microprocessor while accessing memory segment? a. INTA b. DTE c. HOLD d. ALE	C302.3	R
3.(b)	What is internal RAM memory of 8051 Microcontroller? a. 128 bytes b. 256 bytes c. 32 bytes d. 64 bytes		R
4.(a)	How many Timer/Counter in 8051 Microcontroller? a. 1 b. 2 c. 4 d. 8	C302.3	R
4.(b)	Register that is use to hold the memory address of the next instruction to be executed is a. Program Memory b. Program Counter c. Control Unit d. Instruction decoder		R
5.(a)	The 8051 Microcontroller has _____ Parallel I/O ports a. 2 b. 4 c. 8 d. 1	C302.3	R
5.(b)	The 8051 Microcontroller, the address bus _____ bit wide a. 8 b. 16 c. 32 d. 4		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	State any four data transfer Instruction with example	C302.2	U
7	Examine the functioning of CMP Instruction	C302.2	R
8	Differentiate CALL and JUMP instruction	C302.2	U
9	Distinguish between Microporcessor and Microcontroller	C302.3	U
10	State any four inbuilt features of 8051	C302.3	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Describe the Arithmetic instructions of 8085.	C302.2	R
	Or		
12	Write an ALP for finding the biggest numbers in a block of data stored in the memory locations from 5000 to 5004, finally stored the biggest number in the location 5010.	C302.2	U
13	Explain about pin details of 8051 microcontroller in detail.	C302.2	R
	Or		
14	Briefly discuss about memory organization of 8051 micrcontroller.	C302.2	R

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Discuss with a neat block diagram of 8051 Microcontroller architecture.	C302.3	R
	Or		
16	Short notes on various addressing modes in 8051 with suitable example.	C302.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.S.Vijayalakshmi & Mr.M.Marimuthu

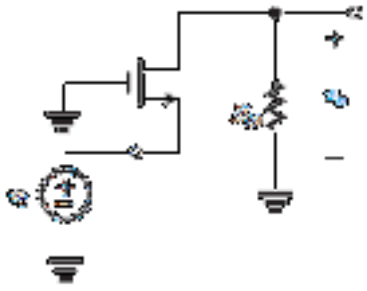
Saranathan College of Engineering

Tiruchirappalli

Internal Assessment Test – III			Date/ Session	04/11/2020 & FN	Marks	50
Course code	EC8353	Course Title	Electron Devices and Circuits			
Batch No.		Duration	90 mins	Academic Year	2020-2021/ ODD	
Year	II	Semester/ Section	III / A & B	Department	EEE	

Part – A (20 Marks)

I. Choose the correct answer for the following Questions **(10 x 1 = 10marks)**

Q. No.	Questions	CO	Skills
1.(a)	The h parameter approach gives correct results for … a) Large signals only, b) Small signals only , c) Both small and large signals and d) None of the above.	C205.3	U
1.(b)	In order to determine hfe and hie parameters of a transistor, …… is an a.c. short-circuited a) Input , b) Output , c)Input as well as output and d) None of the above		U
2.(a)	Which amplifier is called as Voltage Follower _____ a) CC b) CB ,c) CE, d) All the above.	C205.3	R
2.(b)	The Characteristics of a CE amplifier _____ a) Large Current gain (AI) , b) Voltage phase shift of 180^o ,c) Large Voltage gain(AV) , d) All the above.		R
3.(a)	In which of the following configuration does a MOSFET works as an amplifier? a) Common Source (CS), b) Common Gate (CG), c) Common drain (CD) and d) All of the mentioned.	C205.3	U
3.(b)	The MOSFET in the following circuit is in which configuration?  a) Common Source (CS) , b) Common Gate (CG) , c) Common Drain (CD) , d) None of the mentioned.		R
4.(a)	If the voltage gain of the amplifier is 100, calculate its gain on dB scale. a) 30 dB , b) 40 dB , c) 50 dB and 60 dB.	C205.4	AZ
4.(b)	Two amplifiers having gain 20 dB and 40 dB are cascaded. Find the overall gain in dB. a) 40 dB , b) 50 dB , c) 60 dB and d) 70 dB.		AZ
5.(a)	A gain of 1,000,000 times in power is expressed by ……. a) 30 db , b) 60 db ,c)120 db , d) 600 db	C205.4	AZ
5.(b)	A radio receiver has …… of amplification One stage, b)Two stages ,c)Three stages, d)More than one stages		R

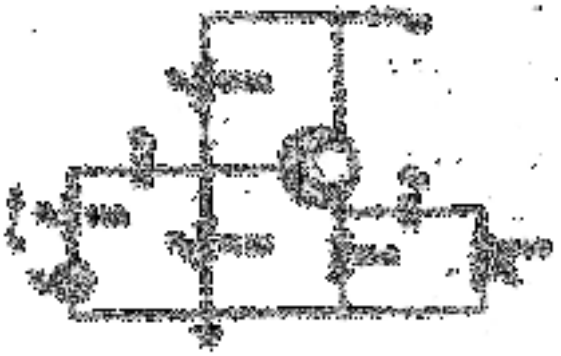
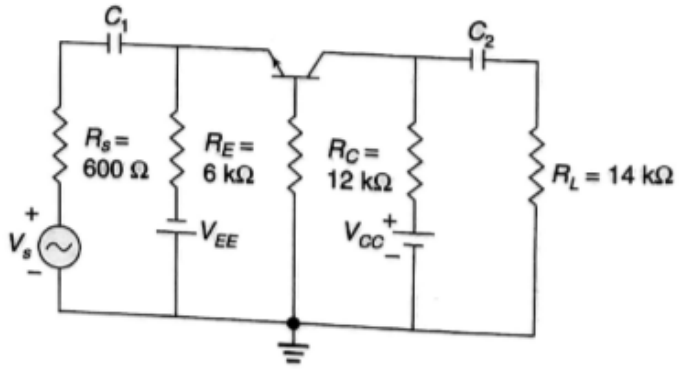
II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	Write the hybrid parameters equation of transistor amplifier?	C205.3	U
7	Draw the simplified hybrid model for the CB circuit.	C205.3	R
8	List the classifications of amplifiers.	C205.3	R

9	Mention any two advantages of representation of Gain in Decibels.	C205.4	R
10	What is the need for Cascading?	C205.4	U

Part – B

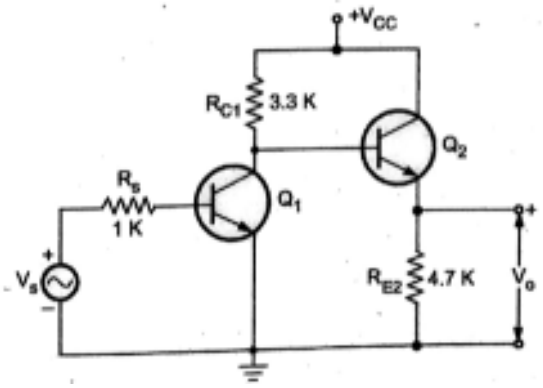
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	From the two port model of a BJT amplifier in CE configuration, derive the expressions for input impedance, current gain, voltage gain and output admittance.	C205.3	U
	Or		
12	Draw and explain the Common Source Amplifier circuit and small signal equivalent circuit using the voltage –source model of a MOSFET .	C205.3	R
13	In the Common Collector, the transistor parameters are hic=1.2 K, hfc=-101, hrc=1 and hoc=25 μA/V. Calculate the Ri, Ai, Av, Avs and Ro for the given circuit. 	C205.3	AZ
	Or		
14	Calculate the values of input resistance, output resistance, current gain and voltage gain for the CB amplifier circuit shown in fig. The transistor parameters are hib=24Ω, hfb=0.98, hob=0.49 μA/V and hrb=2.9x10^{-4} . 	C205.3	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	a) Explain the theory of multistage amplifier and their limitations (6) b) Discuss about the importance of gain in Decibels (4)	C205.4	U
	Or		

16	With the help of the fig and following transistor parameters at the Quiescent point , Calculate the input impedance , output impedance and individual as well as overall current and voltage gain of two stage common emitter-common collector amplifier circuit as shown in fig: where hie=2 K, hfe=50, hre=0, hoe=0. 	C205.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms. C.Pearline Kamalini AP/EEE & Mr.R.Sridhar AP/EEE

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test – III			Date/Session	02.11.2020 (AN)	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	1 ½ hours	Academic Year	2020-2021/ODD	
Year	II	Semester	03	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(6x1=6 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	A decimal counter has _____ states. a) 5 b) 10 c) 15 d) 20	C202.2	R
1.(b)	Ripple counters are also called _____ a) SSI counters b) Asynchronous counters c) Synchronous counters d) VLSI counters		R
2.(a)	How many flip-flops are required to construct a decade counter? a) 4 b) 8 c) 5 d) 10	C202.2	R
2.(b)	How many different states does a 3-bit asynchronous counter have? a) 2 b) 4 c) 8 d) 16		R
3.(a)	A 4-bit counter has a maximum modulus of _____ a) 3 b) 6 c) 8 d) 16	C202.2	R
3.(b)	In asynchronous circuit, the changes occur with the change of **a. input** **b. output** **c. clock** **d. time**		R

II. Answer all the Questions **(7x2=14Marks)**

Q. No.	Questions	CO	Skills
4	What are the two models in synchronous sequential circuits	C202.3	U
5	**Differentiate Mealy and Moore model**	C202.3	U
6	Differentiate synchronous and Asynchronous counter	C202.3	A
7	Draw the block diagram of Asynchronous circuit	C202.3	A
8	Draw the state diagram of Mod-8 up down synchronous counter	C202.3	A
9	Find the number of flip-flops is required to generate the sequence 11011010	C202.3	AZ
10	Draw the 3-bit asynchronous counter	C202.3	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Design a Binary ripple counter	C202.3	AZ
	Or		
12	Design Mod-9 counter	C202.3	AZ
13	Design and explain the operation of Mod-5 synchronous counter	C202.3	AZ
	Or		
14	Design the series of 110011	C202.3	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Design an asynchronous sequential circuit with two inputs X and Y and with one output Z. Whenever Y is 1, input X is transferred to Z, when Y is o, the output does not change for any change in X.	C202.4	AZ
	Or		
16	Design an asynchronous sequential circuit which has two inputs X & Y and a single output which behaves in the following manner. Initially both inputs and outputs are equal to zero. Whenever X=1 & Y=0, Z becomes 1. Whenever X=0, Y=1, Z becomes zero. When both inputs are zero or one, output does not change.	C202.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Ms.A.R.Danila Shirly & Dr.S.Vijayalakshmi

Saranathan College of Engineering
Tiruchirappalli - 620012

Internal Assessment Test – III			Date/Session	05-11-2020 (AN)	Marks	50
Course code	EE8551	Course Title	Microprocessor & Microcontroller			
Batch No.		Duration	1 ½ hours	Academic Year	2020-2021/ODD	
Year	III	Semester	05	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	**How many pins does the 8255 PPI IC contains?** a. 24 b. 20 c. 32 d. 40	C302.4	R
1.(b)	**Which of the following pins are responsible for handling the on the Read Write control logic unit of the 8255 PPI?** a. CS' b. RD' c. WR' d. ALL of the above		R
2.(a)	When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected? a) PSW b) SP c) DPTR d) PC	C302.4	R
2.(b)	Are PUSH and POP instructions are a type of CALL instructions? a) yes b) no c) none of the mentioned d) cant be determined		R
3.(a)	What is the meaning of the instruction MOV A,05H? a) data 05H is stored in the accumulator b) fifth bit of accumulator is set to one c) address 05H is stored in the accumulator d) none of the mentioned	C302.5	R
3.(b)	Which operator is the most important while assigning any instruction as register indirect instruction? a) $ b) # c) @ d) &		R
4.(a)	If SUBB A,R4 is executed, then actually what operation is being applied? a) R4+A b) R4-A c) A-R4 d) R4+A	C302.5	R
4.(b)	What is the bit size of the 8051 Microcontroller? a) 8-bit b) 4-bit c) 16-bit d) 32-bit		R
5.(a)	Number of I/O ports in the 8051 Microcontroller? a) 3 ports b) 4 ports	C302.5	R

	c) 5 ports d) 4 ports with last port having 5 pins		
5.(b)	Program counter stores what? a) Address of before instruction b) Address of the next instruction c) Data of the before execution to be executed d) Data of the execution instruction		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	**What is the difference between MOVX and MOV ?**	C302.5	U
7	**What is an USART.**	C302.4	R
8	**What is the function of the TMOD register?**	C302.4	U
9	**Name the major block of 8259 Programmable Interrupt Controller.**	C302.4	U
10	**Give the details of PSW register in 8051.**	C302.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the modes of operation of 8255.	C302.4	R
	Or		
12	Discuss the working modes of Timer in 8254	C302.4	U
13	Short notes on USART 8251	C302.4	R
	Or		
14	Short notes on Interrupt controller 8259	C302.4	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Explain in detail about Arithmetic instruction of 8051	C302.5	R
	Or		
16	Explain in detail about Logical instruction of 8051.	C302.5	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.S.Vijayalakshmi & Mr.M.Marimuthu

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/Session	06-10-2021 /FN	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2021 – 2022	
Year	II	Semester/Section	III	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the sources and effects of electromagnetic fields?	C203.1	R
2	How is the unit vectors defined in a cylindrical & spherical co-ordinate system?	C203.1	R
3	Points P and Q are located at (0,2,4) and (-3,1,5). Calculate the distance vector from P to Q.	C203.1	A
4	Given $\vec{A} = 4\,\vec{a_x} + 6\,\vec{a_y} - 2\,\vec{a_z}$ and $\vec{B} = -2\,\vec{a_x} + 4\,\vec{a_y} + 8\,\vec{a_z}$. Show that the vectors are orthogonal.	C203.1	A
5	Express in matrix form the unit vector transformation from the rectangular to cylindrical co-ordinate system.	C203.1	R
6	Explain Electric field Intensity with its equation	C203.1	A
7	Define stokes theorem	C203.1	R
8	Find the vectors defined by points (-2,1,-1) and (0,3,1)	C203.1	A
9	Convert the given rectangular coordinates A(2,3,1) into corresponding cylindrical coordinates.	C203.1	A
10	Find the divergence of the field $P=x^2yzi+xzk$	C203.1	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive Electric field Intesity due to Finite and Infinite long conductor	C203.1	R
	Or		
12	If $\vec{A} = y\,\vec{a_x} + (x+z)\,\vec{a_y}$ and a point Q is located at (-2,6,3), express (1) the point Q in cylindrical and spherical coordinates, (2) $\vec{A}$ in cylindrical and spherical coordinates.	C203.1	AZ
13	Verify divergence theorem, where $\vec{A} = 2xy\,\vec{a_x} + y^2\,\vec{a_y} + 4yz\,\vec{a_z}$ and S is the surface of the cube bounded by x = -1, x = 1, y = -1, y = 1, z = 0, z = 1.	C203.1	AZ
14	Determine the divergence of these vector fields. a) $\vec{A} = \mathbf{yz}\,\vec{a_x} + \mathbf{4xy}\,\vec{a_y} + \mathbf{y}\,\vec{a_z}$ at (1,-2,3); b) $\vec{B} = \boldsymbol{\rho z sin\phi}\,\vec{a_\rho} + \mathbf{3}\boldsymbol{\rho z^2 cos\phi}\,\vec{a_\phi}$ at (5,π/2,1) ; c) $\vec{C} = \mathbf{2rcos\theta}\boldsymbol{cos\phi}\,\vec{a_r} + \mathbf{r^{1/2}}\vec{a_\phi}$ at (1,π/6, π/3)	C203.1	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Determine the divergence of the vector fields. a) $\vec{A} = \mathbf{x^2yz}\,\vec{a_x} + \mathbf{xz}\,\vec{a_z}$; b) $\vec{B} = \mathbf{rsin\phi}\vec{a_r} + \mathbf{r^2z}\,\vec{a_\phi} + \mathbf{zcos\phi}\,\vec{a_z}$; c) $\vec{C} = \frac{\mathbf{1}}{\mathbf{r}}\mathbf{cos\theta}\,\vec{a_r} + \mathbf{rsin\theta cos\phi}\,\vec{a_\theta} + \mathbf{cos\theta}\,\vec{a_\phi}$	C203.1	AZ
	Or		
16	Express vector $\vec{B} = \frac{10}{r}\vec{a_r} + r\cos\theta\,\vec{a_\theta} + \vec{a_{\phi_\phi}}$ in Cartesian and Cylindrical coordinates. Find $\vec{B}(-3,4,0)$ and $\vec{B}\left(5,\frac{\pi}{2},-2\right)$	C203.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Name of the faculty*:*Prof.Gayathri Natarajan

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – II			Date/Session	29-10-2021 /FN	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2021 – 2022	
Year	II	Semester/Section	III	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Find the electric field intensity in free space if $\vec{D} = 30\ a_x\ C/m^2$.	203.2	E
2	State the properties of electric flux lines.	203.2	U
3	Write down the Poisson's and Laplace equations and give the significant physical differences.	203.2	A
4	Define dipole moment and electric polarization.	203.2	R
5	Distinguish electric scalar potential and potential difference.	203.2	U
6	Determine Biot Savarts Law	203.4	A
7	Define Magnetic Field Intensity	203.4	A
8	Define Electro static Energy and its Energy Density	203.3	A
9	Find the capacitance when charge is 20 C has a voltage of 1.2V.	203.3	A
10	Define Equipotential Surfaces.	203.3	A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive an expression for potential (V) and electric field intensity ($\vec{E}$) due to an Electric Dipole and also derive potential due to infinite uniformly charged line.	203.3	E
	Or		
12	Derive an expression for the capacitance of a parallel plate capacitor and coaxial cable	203.3	E
13	Derive an expression for Electric Field Intensity at a point due to finite and an infinite conductor of wire.	203.2	E
	Or		
14	Determine the Electric boundary condition for Dielectric-to-Dielectric Medium	203.2	E

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Determine the Magnetic field Intensity due to infinte long straight filament.	203.4	AZ
	Or		
16	Derive an expression for Electric Field Intensity at a point due to infinite sheet and circular disc.	203.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Name of the faculty : Prof. Gayathri Natarajan

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – III			Date/Session	3-11-2020 /FN	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2020– 2021	
Year	II	Semester/Section	III/ A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	i) Find the Lorentz force of a charge 2.5C having an electric field of 5 units and magnetic field of 7.25 units with a velocity 1.5 m/s. a) 39.68 b) 68.39 c) 86.93 d) 93.68 ii) When the currents are flowing in the same direction in two conductors, then the force will be a) Attractive b) Repulsive c) Zero d) Data insufficient	C203.4	A
2	i) Find the torque on the conductor having current 2A, flux density 50 units, length 15 cm and distance of 8 m form the axis. a) 120 b) 240 c) 800 d) 350 ii) Find the inductance of a coil with 50 turns, flux 3 units and a current of 0.5 A. a) 150 b) 300 c) 450 d) 75	C203.4	A
3	i) Electric field will be maximum outside the conductor and magnetic field will be maximum inside the conductor. State true or false. a) True b) False ii) The magnetic moment of a field with current 12A and area 1.6 units is a) 19.2 b) 12.9 c) 21.9 d) 91.2	C203.4	A
4	i) Magnetisation is defined by the ratio of a) Magnetic moment to area	C203.4	A

	b) Magnetic moment to volume c) Magnetic flux density to area d) Magnetic flux density to volume ii) Motional emf induced in a conductorhaving a length of 50 cm moving at a velocity 5m/s in a magnetic field of 2 units is a) 5volts b) 10 volts c) 1 volt d) zero		
5	i) when a conductor is moving in a time varying magnetic field, then the emf induced in it will be a) motional emf b) transformer emf c) both motional and transformer emf d) zero ii) A closed conductor placed in magnetic field of 2 units is carrying a current of 3A. force on the conductor is a) 1.5 N b) 2.2N c) Zero d) 3.4N	C203.4	R
6	Write the differential form of "Law of non-existence of isolated monopoles".	C203.5	R
7	A charged particle passes through a magnetic field without experiencing any force. What can you conclude about the magnetic field?	C203.5	R
8	State amperes circuital law.	C203.5	U
9	Write down the magnetic boundary conditions.	C203.5	R
10	State Biot-savarts law.	C203.5	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive the expressions for magnetic field intensity due to long straight filament	C203.4	U
	or		
12	Derive the expressions for inductance of coaxial Cable	C203.4	U
13	Derive the expressions for magnetic field intensity due to coaxial cable	C203.5	U
	Or		
14	Derive the expressions for force on a wire carrying current I placed in magnetic field.	C203.5	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Derive the expression for conduction current and displacement current	C203.6	U
	or		
16	Explain Maxwells equation 1 with its equation	C203.6	R & U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test - I			Date/Session	14.09.2020 / AN	Marks	50
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration	90 Minutes	Academic Year	2020-2021/ODD	
Year	II	Semester	III	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	The thermal efficiency of a steam power station is..... a) 38% b) 28% c) 40% d) 50%	C206.1	R
1.(b)	The height of chimney in a steam power plant is governed by..... a) Flue gases quantity b) The draught to be produced c) Control of pollution d) Corner of power plant		R
2.(a)	The major heat loss in a steam power station occurs in ..... a) Heat chamber b) Economizer c) Boiler d) Condenser	C206.1	R
2.(b)	The alternator is used in power plants which converts..... a) Electrical Energy into Mechanical Energy b) Electrical energy into Solar Energy c) Mechanical Energy into Electrical Energy d) Mechanical Energy into Nuclear Energy		R
3.(a)	For forced draught system, the function of chimney is mainly..... a) To produce draught to accelerate the combustion of fuel b) To discharge gases high up in the atmosphere to avoid hazard c) To reduce the temperature of the hot gases discharged d) None of the above	C206.1	R
3.(b)	The commercial source of energy..... a) Fossil fuels, hydropower, nuclear power b) Wood, animal waste, agriculture waste c) Solar, wind, biomass d) None of the above		R
4.(a)	The modern steam turbines are..... a) Impulse turbine b) Reaction turbine c) Impulse-reaction turbine d) None of the above	C206.1	R
4.(b)	Economizer is used to heat..... a) Feed Water b) Air c) Flue gases d) All of the above		R
5.(a)	Pipes carrying steam are generally made up of..... a) Cast iron b) Steel c) Copper d) Aluminum	C206.1	R
5.(b)	Belt conveyer can be used to transport coal at inclinations upto..... a) 600 b) 300 c) 450 d) 800		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	What are the factors that affect the selection of site for a thermal power plant?	C206.1	U
7	Define pulverization and why it is used?	C206.1	R
8	What are the functions of super heater and economizer in a thermal power plant and mention its application?	C206.1	U
9	Name the thermal power plants in Tamil Nadu with their installed capacity.	C206.1	R
10	Define steam and heat rate.	C206.1	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain with neat sketch the working of a thermal power plant and discuss the various methods adopted in Rankine cycle improvement for increasing the performance of modern steam power plant. (10)	C206.1	U
	Or		
12	Explain with neat sketch the working of FBC and its types. (10)	C206.1	U
13	Explain with neat sketch the working of deaerator and its types in feed water treatment. (10)	C206.1	U
	Or		
14	Explain with neat sketch the working of Coal and Ash handling plant. (10)	C206.1	U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Explain with neat sketch the laws of Thermodynamics. (10)	C206.1	U
	Or		
16	Explain the working of Rankine Cycle and Regenerative Cycle with P-V and T-S Diagram. (10)	C206.1	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.C.Krishnakumar, Prof & HoD/EEE and Dr.P.K.Arun Kumar

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test - II			Date/Session	07.10.2020 / AN	Marks	50
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration		Academic Year	2020-2021/ODD	
Year	II	Semester	III	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	**The diesel engine power plant are mainly used as** a) Base load power plant b) Peak load power plant c) Stand-by power plant d) option 2 & 3	C206.2	R
1.(b)	**In a 2 stroke engine, the operation cycle are completed in how many strokes and revolution?** a) 2 stroke and 2 revolutions. b) 2 strokes and 1 revolution. c) 2 strokes and 3 revolution. d) 2 strokes and 4 revolution.		R
2.(a)	**The following is (are) the limitation(s) of gas turbines.** a) They are not self starting b) Higher rotor speeds c) Low efficiencies at part loads d) All of the above	C206.2	R
2.(b)	In a gas turbine, high thermal efficiency is obtained in..... a) Closed cycle b) Open cycle c) Combined cycles d) Option 1 & 3		R
3.(a)	**Amongst the following, the fissionable materials are** a) U233 and Pu239 b) U233 and Pu233 c) U235 and Pu235 d) U238 and Pu239	C206.3	R
3.(b)	**Moderator in nuclear plants is used to** a) extract heat from nuclear reaction b) moderate the radioactive pollution c) control the reaction d) cause collision with the fast moving neutrons to reduce their speed		R
4.(a)	**The most commonly used moderator in nuclear plants is** a) heavy water b) deuterium c) graphite and concrete d) graphite	C206.3	R
4.(b)	**The commonly used material for shielding is** a) lead or concrete b) lead and tin c) thick galvanized sheets d) graphite or cadmium		R
5.(a)	**Reflector in nuclear plants is used to** a) return the neutrons back into the core b) shield the radioactivity completely c) check pollution d) conserve energy	C206.3	R
5.(b)	**Gas cooled reactor uses following materials as moderator, and coolant** a) graphite, C02 b) graphite, air c) heavy water, C02 d) lead, H2		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	List the working fuels that are used in gas turbines.	C206.2	R
7	List the devices used for improvisations in gas turbine power plants.	C206.2	R
8	What is meant by half - life of nuclear fuels?	C206.3	U
9	What are the functions of control rods?	C206.3	U
10	What are the desirable properties of a moderator?	C206.3	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the working of a diesel power plant with neat sketch and describe its merits, demerits and applications. (10)	C206.2	U
	Or		
12	Explain the layout of an integrated gasifier based combined cycle power plant with neat sketch. (10)	C206.2	U
13	Explain with neat sketch the working of combined cycle power plants and describe its merits, demerits and applications. (10)	C206.2	U
	Or		
14	Explain the working of open cycle and closed cycle gas turbine power plants and discuss its advantages and disadvantages. (10)	C206.2	U

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	i) Explain the working of PWR with neat sketch. (5) ii) Explain the working of CANDU reactor with neat sketch. (5)	C206.3	U
	Or		
16	i) Explain the working of LMFBR reactor with neat sketch. (5) ii) Explain the working of gas cooled reactor with neat sketch. (5)	C206.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.C.Krishnakumar, Prof & HoD/EEE and Dr.P.K.Arun Kumar

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test - III			Date/Session	04.11.2020 / AN	Marks	50
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration	90 Minutes	Academic Year	2020-2021/ODD	
Year	II	Semester	III	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	**Surge tank is for the protection of.....** a) Dam b) Spillways c) Penstock d) Head works	C206.4	R
1.(b)	**Which of the following is not an advantage of hydroelectric power plant?** a) no fuel requirement b) low running cost c) continuous power source d) no standby losses		R
2.(a)	**Solar thermal power generation can be achieved by** a) using focusing collector or heliostates b) using flat plate collectors c) using a solar pond d) any of the above system	C206.5	R
2.(b)	**Fuel cell performance is not limited by _____** a) First law of Thermodynamics b) Second law of Thermodynamics c) Third law of Thermodynamics d) All three laws are applicable		R
3.(a)	**The main source of production of biogas is.....** a) Human waste b) Wet cow dung c) Wet livestock waste d) all of the above	C206.5	R
3.(b)	**For exactly how much time does it take for one tidal cycle?** a) 22h, 20min b) 24h, 50min c) 20h, 10min d) 22h, 50min		R
4.(a)	**Waves are caused indirectly by _____** a) Wind energy b) Solar energy c) Geo-thermal energy d) Wave energy	C206.5	R
4.(b)	**Which of these should not be a properties of fuel cell electrodes?** a) good electrical conductors b) highly resistant to corrosive environment c) should perform charge separation d) take part in chemical reactions		R
5.(a)	**The ocean thermal energy conversion(OTEC) is uses _____** a) Energy difference b) Potential difference c) Temperature difference d) Kinetic difference	C206.5	R
5.(b)	**Closed cycle systems use the fluid having _____** a) High boiling points b) Low boiling points c) High viscosity d) Low viscosity		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	What are the factors that affect the selection of a water turbine for hydel plants?	C206.4	U
7	What are the types of solar collectors?	C206.5	U
8	Define economics of power generation.	C206.6	R
9	What are the significances of load curve?	C206.6	U
10	Distinguish the merits and demerits of nuclear, thermal and hydro power plants.	C206.6	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the arrangement of the components of a hydroelectric power plant with neat sketch. (10)	C206.4	U
	Or		
12	Explain the pumped storage hydro plant with neat sketches and high light their advantages. (10)	C206.4	U
13	i) Explain the methods used to calculate the deprecation cost of power plant equipment. (5) ii) Explain the waste disposal of nuclear power plants. (5)	C206.6	U
	Or		
14	i) Explain the following terms (a) Load curve (b) Plant capacity factor (c) Plant utilization factor (d) Reserve capacity of the plant. (4) ii) Explain the various power tariff structures adopted by TANGEDCO to calculate the tariff. (6)	C206.6	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Explain the working of bio gas plant with neat sketch and list out its advantages and disadvantages. (10)	C206.5	U
	Or		
16	i) Explain the working of wind power plant with neat sketch and list out its advantages and disadvantages. (5) ii) Explain any two types of direct energy conversion devices with neat sketch. (5)	C206.5	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.C.Krishnakumar, Prof & HoD/EEE and Dr.P.K.Arun Kumar

Saranathan College of Engineering

Tiruchirapalli

Model Exam - Multiple Choice Question Test		Date/Session	19-11-2020/FN	Marks	60
Course code	ME8792	**Course Title**	Power Plant Engineering		
Batch No.		**Duration**	60 mins	**Academic Year**	2020 - 2021
Year	II	**Semester**	III	**Department**	B.E. EEE

Part – A
(Answer all the questions 30 x 1 = 30 marks)

1. How flue gas is made use of in steam power plant?
   a) To maintain the constant pressure inside boiler b) To heat the water in the tubes of boiler
   c) To increase or decrease the pressure inside the boiler
   d) To remove all unnecessary chemical constituents

2. When is the cooling tower preferred?
   a) When there is plenty of water available b) When there is scarcity of water
   c) When the plant is of large capacity d) When the amount of flue gas produced is very high

3. Super heater tubes are made up of what type of material?
   a) Copper alloy b) Carbon steel c) Titanium alloy d) Iron

4. What is the main purpose of using an economizer in a boiler?
   a) To control the process of steam conversion b) To reduce energy consumption
   c) To increase the temperature of boiler d) To maintain a constant temperature inside a boiler

5. What is the use of electrostatic precipitations in steam power plant?
   a) To remove the steam b) To draw the coal powder into boiler
   c) To remove the feed water d) To remove fly ash

6. Which two nuclear fuels are produced artificially?
   a) $_{92}Pu^{239}$ and $_{92}U^{233}$ b) $_{92}Pu^{244}$ and $_{92}U^{234}$
   c) $_{92}Pu^{241}$ and $_{92}U^{235}$ d) $_{92}Pu^{242}$ and $_{92}U^{236}$

7. What is necessary for complete combustion of fuels?
   a) There should be no water content in the fuel b) Sufficient amount of air is required
   c) High quantity of fuel d) Open space to burn easily

8. What is the necessity of supercharger in the diesel engine plants?
   a) Supercharger helps in drawing out heat from engine
   b) Supercharger supports engine as auxiliary source of power
   c) Supercharger improves engine efficiency
   d) Supercharger increases pressure of air

9. What is used in engines to reduce the noise at the exhaust?
   a) Noise dampers b) Baffles c) Silencers d) Composite foam

10. What is the air standard cycle for a Gas-Turbine called?
   a) Reheat cycle b) Rankine cycle c) Brayton cycle d) Diesel cycle

11. Which among these is the main component of a gas turbine plant?
   a) Condenser b) Compressor c) Boiler d) Both Compressor & Boiler

12. The gas turbine power plant mainly uses which among the following fuels?
a) Coal and Peat b) Kerosene oil and diesel oil and residual oil
c) Gas oil d) Natural gas and liquid petroleum fuel

13. What is the function of moderators in nuclear reactor?
a) absorb the secondary neutrons b) slow down the secondary neutrons
c) control the chain reaction d) none of the mentioned

14. Thorium can be converted into U-233 in a _____ reactor.
a) fast breeder b) liquid metal reactor c) curtis reactor d) none of the mentioned

15. Which of the following types of nuclear reactors is most prone to radioactive hazards?
a) Gas cooled reactor b) Molten Sodium Reactor
c) Boiling water reactor d) Pressurised water reactor

16. The time required for half of the _____ of a radioactive isotope to decay is called its half-life.
a) neutron b) electron c) proton d) nuclei

17. _____ moderator is used in a fast breeder reactor.
a) Heavy water b) Graphite c) No d) Beryllium

18. A fertile material is the one, that can be _____
a) converted into fissile material on absorption of neutron
b) fissioned by either slow or fast neutrons c) fissioned by slow (thermal) neutrons
d) fissioned by fast neutrons

19. In which turbine the pressure energy of water is first converted into kinetic energy by means of nozzle kept close to the runner?
a) Impulse turbine b) Reaction turbine c) Both Impulse and Reaction turbine
d) None of the mentioned

20. The energy of water entering the reaction turbine is _____
a) fully the kinetic energy b) fully the pressure energy
c) partly the pressure energy and partly the kinetic energy d) unpredictable

21. Which of the following is an example of impulse turbine?
a) Propeller turbine b) Francis turbine c) Kaplan turbine d) Pelton wheel

22. A rotor installed in a fixed orientation with the swept area perpendicular to the pre dominate wind direction is called _____
a) Nacelle b) Yaw fixed machines c) Blades d) Anemometer

23. For which of these devices does negative charge carriers flow from anode to cathode in the external circuit?
a) MHD generator b) Thermionic generator c) Thermoelectric generator
d) Fuel cell

24. Which part of flat plate collectors is coated in black?
a) Transparent cover b) Absorber plate c) Insulation d) Fins

25. What tide of tide is it called when two high tides and two low tides of approximately equal size occur?
a) Diurnal tide b) Spring tide c) Neap tide d) Semi-Diurnal tide

26. The process of producing energy by utilizing heat trapped inside the earth surface is called _____
a) Hydrothermal energy b) Geo-Thermal energy
c) Solar energy d) Wave energy

27. Which of the following is equal to the maximum demand?
a) The ratio of area under curve to the total area of rectangle
b) The ratio of area under curve and number of hours
c) The peak of the load curve d) The area under the curve

28. Size and cost of installation depends upon _____
a) average load b) maximum demand
c) square mean load d) square of peak load

29. The load factor is _____
a) always less than unity b) less than or greater than 1
c) always greater than 1 d) less than zero

30. Which power plant has minimum operating cost?
a) Hydroelectric power plant b) Thermal power plant
c) Nuclear power plant d) Gas Turbine Power Plant

Part – B
(Answer all the questions 15 x 2 = 30marks)

1. Which of the following pump is preferred for flood control and irrigation applications?
a) Reciprocating pump b) Axial flow pump c) Mixed flow pump d) Centrifugal pump

2. In a reaction turbine, the draft tube is used _____
a) to increase the head of water by an amount equal to the height of the runner outlet above the tail race
b) to transport water to downstream c) to run the turbine full
d) to prevent air to enter the turbine

3. The control rods in the control system of nuclear reactors are used to _____
a) control fuel consumption b) absorb excess neutrons
c) control temperature d) all of the mentioned

4. Number of working strokes per min. for a two stroke cycle engine are _____ the speed of the engine in r.p.m.
a) equal to b) one-half c) four-times d) twice

5. Which of the following statement is correct?
a) Compression ratio for petrol engines varies from 6 to 10
b) Petrol engines work on Otto cycle
c) Higher compression ratio in diesel engines results in higher pressures
d) All of the mentioned

6. Which material is most commonly used for shielding?
a) Carbon b) Concrete c) Lead d) All of the mentioned

7. Which of these fuel cells operates at high temperatures and pressures?
a) high temperature solid oxide fuel cell b) alkaline fuel cell
c) molten carbon fuel cell d) phosphoric acid fuel cell

8. How are moderate active solid wastes disposed?

a) Buried underground b) Buried under sea
c) Sent to outer space d) Left out in streams or rivers

9. How much must be the tidal range over barrage to be feasible?

a) 7 meters b) 25 meters c) 10 meters d) 20 meters

11. How much is the efficiency of geothermal plant?

a) 28% b) 15% c) 42% d) 30%

12. Which of the following has the lowest efficiency?

a) Solar energy b) Wind energy c) Wave energy d) OTEC

13. What is Demand factor?

a) Ratio of connected load to maximum demand
b) Ratio of average load to connected load
c) Ratio of maximum demand to the connected load
d) Ratio of kilowatt hour consumed to 24 hours

14. Which of the following is called as cold reserve?

a) Reserve capacity available but not ready for use
b) Reserve capacity available and ready for use
c) Generating capacity connected to bus and ready to take load
d) Capacity in service in excess of peak load

15. When load factor and diversity factor increases _____

a) cost of electricity decreases b) cost of electricity also increases
c) cost of electricity remains same d) cost of electricity increases exponential

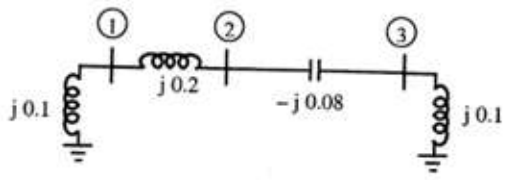
Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test - I			Date/Session	11.9.2020	Marks	50
Course code	EE8501	Course Title	Power System Analysis			
Batch No.		Duration	90 min	Academic Year	2020-2021/ODD	
Year	III	Semester	V-A&B	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

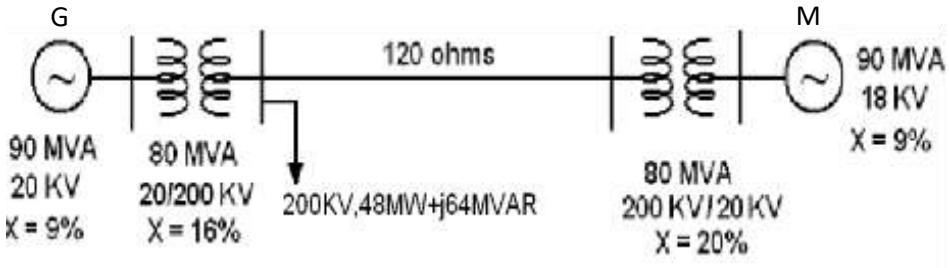
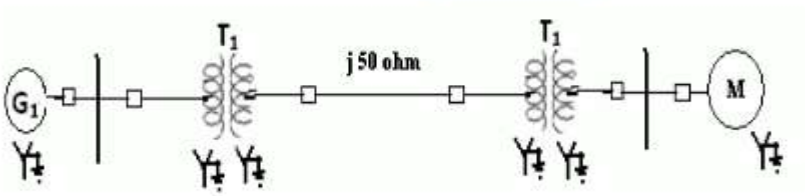
Q. No.	Questions	CO	Skills
1.(a)	**Which among these is the major advantage of per unit computations?** a. Per unit impedance of transformers is the same referred to either side of it. b. For simulating steady state and transient models in the computer this method is very useful. c. Manufactures usually specify the impedance of an apparatus in per unit system d. All of these	C301.1	R
1.(b)	What is the per unit impedance Z(Pu) in a three phase system? a. (1000 * $(KV)_B$) / $\sqrt{3}$ I_B b. (Z * $(MVA)_B$) / $(KV)_B^2$ c. (Z * $(KV)_B^2$) / $(MVA)_B$ d. None of these		U
2.(a)	For n bus power system size of Y bus matrix is a. (n-1)*(n-1) b. (n-2)*(n-2) c. n*n d. none of these	C301.1	U
2.(b)	The value of off diagonal elements is a. which is connected between bus i and bus j with positive sign b. which is connected between bus i and bus j with negative sign c. sum of admittances connected at bus i d. sum of admittances connected at bus j		A
3.(a)	What will be the per unit impedance of a synchronous motor having a rating of 100 kVA, 13.2 kV and having a reactance of 75 Ω / ph? a. 0.043 pu b. 0.057 pu c. 0.298 pu d. 0.036 pu	C301.1	U
4.(a)	What is the formula to calculate the (kV)B on the LT section? a. $(kV)_B$ on HT section * (HT voltage rating) / (LT voltage rating) b. $(kV)_B$ on LT section * (HT voltage rating) / (LT voltage rating) c. $(kV)_B$ on HT section * (LT voltage rating) / (HT voltage rating) d. $(kV)_B$ on LT section * (LT voltage rating) / (HT voltage rating)	C301.1	A
4.(b)	A three – bus network is shown in the figure below indicating the p.u. impedance of each element  The bus admittance matrix, Y -bus, of the network is (A) $j\begin{bmatrix} 0.3 & -0.2 & 0 \\ -0.2 & 0.12 & 0.08 \\ 0 & 0.08 & 0.02 \end{bmatrix}$ (B) $j\begin{bmatrix} -15 & 5 & 0 \\ 5 & 7.5 & -12.5 \\ 0 & -12.5 & 2.5 \end{bmatrix}$		E

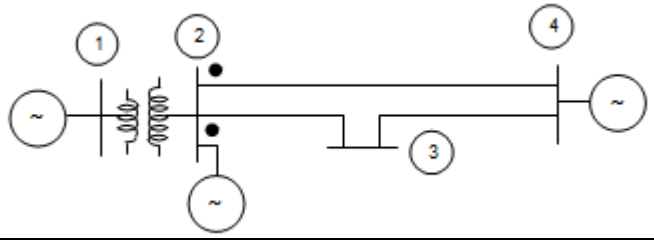
	(C) $j\begin{bmatrix} 0.1 & 0.2 & 0 \\ 0.2 & 0.12 & -0.08 \\ 0 & -0.08 & 0.10 \end{bmatrix}$ (D) $j\begin{bmatrix} -10 & 5 & 0 \\ 5 & 7.5 & 12.5 \\ 0 & 12.5 & -10 \end{bmatrix}$		
5.	The bus admittance matrix of a three-bus three-line system is $Y = j\begin{bmatrix} -13 & 10 & 5 \\ 10 & -18 & 10 \\ 5 & 10 & -13 \end{bmatrix}$ If each transmission line between the two buses is represented by an equivalent π-network, the magnitude of the shunt susceptance of the line connecting bus 1 and 2 is (A) 4 (B) 2 (C) 1 (D) 0	C301.1	E

II. Answer all the Questions **(5x2=10 Marks)**

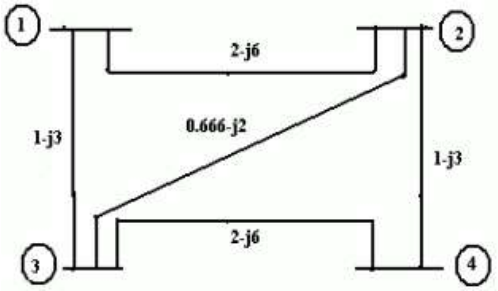
Q. No.	Questions	CO	Skills
6	A Y-connected generator rated at 300MVA, 33kV, has a reactance of 1.24 p.u. Find the ohmic value of the reactance.	C301.1	AZ
7	Mention the approximations made in the reactance diagram	C301.1	U
8	What is single line diagram?	C301.1	R
9	Classify the types of buses based on the specified quantities and the quantities to be obtained from the load flow equations	C301.2	U
10	What is the need of slack bus?	C301.2	A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Draw the p.u impedance diagram for the system shown in figure. Choose Base MVA as 100 MVA and Base kV as 20 kV on Generator side. 	C301.1	AZ
	Or		
12	Examine the reactance diagram for the power system shown in fig. Neglect resistance and use a base of 100 MVA, 220 kV in 50 Ω line. The ratings of the generator motor and transformer are give below. Generator: 40MVA, 25kV, X'' =20%. Synchronous Motor: 50MVA, 11kV, X''=30% T_1: Y-Y transformer : 40MVA 33/220kV, X=15% T_2: Y-Y transformer : 30 MVA 11/220kV, X=15% 	C301.1	AZ

<table>
<tr><td>13</td><td>Form Y_{BUS} using singular transformation method for the following data. Take node 1 as reference node.
<table>
<tr><th>Element Code</th><th>Bus-Code</th><th>Self Impedance in p.u</th></tr>
<tr><td>A</td><td>1-2(1)</td><td>0.6</td></tr>
<tr><td>B</td><td>1-3</td><td>0.5</td></tr>
<tr><td>C</td><td>3-4</td><td>0.5</td></tr>
<tr><td>D</td><td>1-2(2)</td><td>0.4</td></tr>
<tr><td>E</td><td>2-4</td><td>0.2</td></tr>
</table></td><td>C301.1</td><td>E</td></tr>
<tr><td colspan="4">Or</td></tr>
<tr><td>14</td><td>Consider the power network shown in Fig. 1.16. The ground bus is marked as 0. Grounding impedances at buses 1, 2, and 4 are j0.6 Ω, j0.4 Ω and j0.5 Ω respectively. Impedances of the elements 3-4, 2-3, 1-2 and 2-4 are j0.25 Ω, j0.2 Ω, j0.2 Ω and j0.5 Ω. The mutual impedance between elements 2-3 and 2-4 is j0.1 Ω. Obtain the bus admittance matrix of the power network using Singular transformation method.
 
</td><td>C301.1</td><td>U &E</td></tr>
</table>

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	With a net flowchart , load flow algorithm explain the computational procedure for load flow solution using Gauss-Seidal method	C301.2	A
	Or		
16	For the sample system shown in the fig. the generators are connected at all four buses while the loads are at buses 2 and 3. Assuming a flat voltage start, examine bus voltages and bus angles at the end of first Gauss seidal iterations and consider the reactive power limit as $0.2 \leq Q_2 \leq 1$  Bus | P in pu | Q in pu | V in pu | Remarks 1 | - | - | $1.04\angle 0^o$ | Slack bus 2 | 0.5 | - | 1.04pu | PV bus 3 | -1.0 | 0.5 | - | PQ bus 4 | 0.3 | -0.1 | - | PQ bus	C301.2	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.M.V.Suganyadevi, ASP/EEE and Mr.R.Satheesh, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

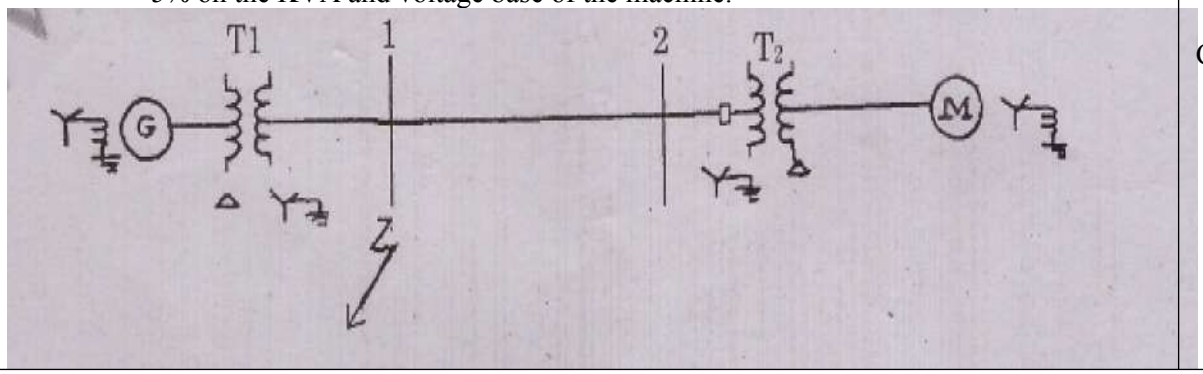
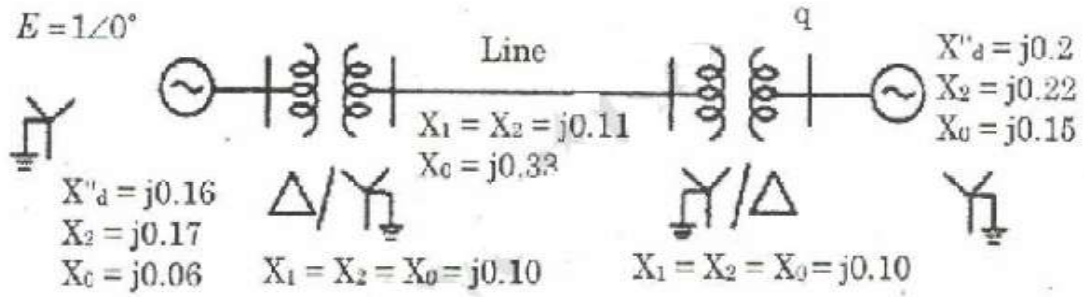
Internal Assessment Test - III			**Date/Session**	**02.11.2020**	**Marks**	**50**
Course code	EE8501	**Course Title**	POWER SYSTEM ANALYSIS			
Batch No.		**Duration**	90 mins	**Academic Year**	2020 - 2021	
Year/	III	**Semester/Section**	V/A&B	**Department**	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	In which fault, the negative and zero sequence currents areabsent? a. LL b.LG c.LLG d.3phase	C301.4	E
2	X_d", X_d', X_d are sub-transient, transient and steady state d-axis reactance of a synchronous machine respectively. Which of the following relationsholds for these three reactances? a. $X_d'=X_d"=X_d$ b. $X_d'>X_d">X_d$ c. $X_d">X_d'>X_d$ d. $X_d>X_d'>X_d"$	C301.4	A
3	The following sequence currents were recorded in a power system under a fault condition: I_1 = -j1.653 p.u., I_2 = j1.653 p.u., I_0 = j0.0 p.u. The naure of fault will be a. Line to line b. Line to ground c. Three phase symmetrical d. Double line to ground	C301.4	R
4	In a power system, two transmission lines, Line A and Line B are connected through a transformer T. A single line-to-ground fault occurs in line A. The fault current will be reflected in Line B if the connection of transformer T is **Options** / **At line A** / **At line B** a. / Grounded star / Star b. / Grounded star / Grounded star c. / Delta / Grounded star d. / Grounded star / Delta	C301.4	A
5	In sequence network, which of the following statements are incorrect? a. The 3 sequence networks are independent of each other b. Neutral of th system is the reference for positive and negative sequence network but ground is the reference for zero sequence network c. There is no voltage source in any seqence network. d. Ground impedance is reflected in zero sequence network as $3Z_n$	C301.4	A
6	What is an unsymmetrical fault? List the various unsymmetrical faults	C301.4	R
7	Discover the symmetrical components V_{a1}, V_{a2} and V_{a0} in terms of unbalanced vectors V_a, V_b and V_c.	C301.4	A
8	Define short circuit capacity	C301.4	R
9	Classify steady state stability limit. Define them.	C301.5	U
10	Define swing curve. What is the use of swing curve?	C301.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive the expression for fault current in line to line fault on unloaded generator. Draw an equivalent network showing the inter connection of networks to simulate double line to line fault	C301.4	AZ
	Or		
12	A single line to ground fault occurs on the bus 1 of the system of Fig shown below. Find (1) Current in the Fault (2) SC current in phase a of generator Given rating of the each machine 1200 KVA, 600V with $X_1=X_2=10\%$, $X_0=5\%$ each three phase transformer is rated 1200 KVA,600/3300 V (Delta-Star) with leakage reactance of 5% the reactance of the transmission line are $X_1=X_2=20\%$ and $X_0=40\%$ on a base of 1200 KVA,3300V the reactance's of the neutral grounding reactors are 5% on the KVA and voltage base of the machine.  	C301.4	E
13	Calculate the sub transient current in each phase for a dead short circuit on the one phase to ground at bus 'q' for the system shown in figure below.  	C301.4	U
	Or		
14	Discuss the expression for fault current in single line to ground fault on unloaded generator. Draw an equivalent network showing the inter connection of networks to simulate single line to ground fault.	C301.4	E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Derive the swing equation for a single machine connected to infinite bus system. State the assumptions if any and state the usefulness of this equation. Neglect the damping	C301.5	AZ
	or		
16	Write a short note on i. Factors influencing transient stability, ii. Voltage collapse	C301.5	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Staff In Charge: Dr.M.V.Suganyadevi,ASP/EEE
Mr. R. Satheesh, AP/EEE

EE8703-RES Model Exam

pearline-eee@saranathan.ac.in Switch account

Your email will be recorded when you submit this form

* Required

6) The best type of coal in terms of purity is * 1 point

- a) lignite.
- b) anthracite.
- c) bituminous.
- d) subbituminous.

31)..... are the periodic rise and fall of ocean water level occurs twice in each lunar day. * 1 point

- a) River water
- b) Sea tides
- c) Ocean tides
- d) b and c

20) Approximately ..... of sun's energy reaching the earth is converted into wind energy. * 1 point

- a) 5%
- b) 2%
- c) 6%
- d) 10%

47) Which company has commissioned India's first rooftop solar carport recently? * 1 point

- a) Moser Baer Solar Ltd
- b) Indosolar Ltd
- c) Tata Power Solar Systems
- d) Websol Energy System Ltd

16)Energy Consumption per unit of GDP is called ..... * 1 point

- Energy Ratio
- b) Energy Intensity
- c) Per capita consumption
- d) None

11)The time from sunrise to sunset is termed as _____ * 1 point

- a) Slope
- b) Day length
- c) Local solar time
- d) Solar intensity

2)What is the rate of solar energy reaching the earth surface? * 1 point

- a) 1016W
- b) 865W
- c) 2854W
- d) 1912W

30)In hydro power generation, ...is usually protected by a rack of metal bars which filters out waterborne debris. 1 point

- a) Forebay
- b) Headrace
- c) Penstock
- d) Spiltway

29) In hydro power plant, the vertical fall of the water is known as the ..... 1 point *

- a) Flow
- b) Head
- c) Head race
- d) All the above

38) The type of Solar Thermal power plant ..... * 1 point

- a) Parabolic trough system
- b) Solar power tower system
- c) Solar dish system
- d) All the above

25)The angle between the chord line of the airfoil and the flight direction is called ..... * 1 point

- a) Leading edge angle
- b) Trailing edge angle
- c) Angle of attack
- d) All the above

42)The term biomass most often refers to _____ * 1 point

- a) inorganic matter
- b) organic matter
- c) chemicals
- d) ammonium compounds

44)How many types of gasifiers are there? * 1 point

- a) 2
- b) 3
- c) 4
- d) 5

37) Which is not a stationary type of solar collector ..... * 1 point

- a) Flat plate
- b) Evacuated tube
- c) Parabolic dish
- d) Compound Parabolic

36) What is the rate of solar energy reaching the earth surface? * 1 point

- a) 1016W
- b) 865W
- c) 2854W
- d) 1912W

35)What are the basic three electrical quantities? * 1 point

- a) Resistance, Capacitance, Inductance
- b) Power, Voltage, Conductance
- c) Voltage, Current, Resistance(Impedance)
- d) Current, Reluctance, Inductance

17)In Tamil Nadu the per capita electricity consumption in 2019-2020 is .....KWh /Year * 1 point

- a) 1,752
- b) 1,507
- c) 1,844
- d) 823

28)..... is referred as “run-of-river” * 1 point

- a) Large-scale hydro
- b) Mini hydro
- c) Micro Hydro
- d) Small Hydro

39) Reliance 100MW solar Compact Linear Fresnel reflector type plant is located in ..... * 1 point

- a) Madhya Pradesh
- b) Rajasthan
- c) Tamil Nadu
- d) None of the above

7) We use most of our oil products for * 1 point

- a) transportation.
- b) electricity generation.
- c) home heating.
- d) industrial uses.

10)Path length of radiation through the atmosphere to the length of path when the sun is at zenith is called _____ * 1 point

- a) Declination
- b) Air mass
- c) Azimuth
- d) Solar Constant

41)Where was the fixed dome concept plant developed? * 1 point

- a) China
- b) America
- c) India
- d) Japan

23) .....control moves rotor to align with the direction of wind. * 1 point

- a) Pitch
- b) Reactive Power
- c) Yaw
- d) Real Power

46)Syngas is produced as a result of ..... * 1 point

- a) Combustion
- b) Gasification
- c) pyrolysis
- d) Anaerobic digestion

8)The amount of energy received in unit time on a unit area perpendicular to the sun's direction at the mean distance of the earth from the sun is called _____ * 1 point

- a) Solar radiation
- b) Solar constant
- c) Intensity of solar radiation
- d) Air Mass

3)What is total amount of solar energy received by earth and atmosphere? * 1 point

- a) 3.8 X 1024 J/year
- b) 9.2 X 1024 J/year
- c) 5.4 X 1024 J/year
- d) 2.1 X 1024 J/year

5)In what form is solar energy is radiated from the sun? * 1 point

- a) Ultraviolet Radiation
- b) Infrared radiation
- c) Electromagnetic waves
- d) Transverse waves

18) India's grid-connected electricity generation capacity is about ..... from non-conventional renewable technologies * 1 point

- a) 87.02GW
- b) 90GW
- c) 66.05GW
- d) 50GW

43)The percentage of carbondioxide in the bio methane is _____ * 1 point

- a) 30-40
- b) 32-43
- c) 35-45
- d) 55-60

40) Gas production of the continuous plant is higher than which of the following plant? * 1 point

- a) Batch plant
- b) Dome plant
- c) Drum plant
- d) Flexible gas biogas plant

12)LST stands for _____ * 1 point

- a) Local standard time
- b) Local solar temperature
- c) Low surface temperature
- d) Land surface temperature

27)Which of the following is true regarding India's goal on renewable energy installation * 1 point

- a) To install 50 GW of wind by 2022
- b) To install 60 GW of wind by 2022
- c) To install 100 GW of PV by 2022
- d) Both (b) and (c)

4)Fossils fuel is an important source of energy for * 1 point

- a) transport
- b) homes
- c) industries
- d) all of them

14)In terms of total primary energy consumption, India stands _____ * 1 point

- a) third
- c) first
- d) fifth

22)In .....turbine it is possible to catch more wind so that the power output can be higher. * 1 point

- a) Horizontal axis
- b) Vertical axis

15)_____ is the largest windfarm in India? * 1 point

- Vindhayachal
- b) Mundra
- c) Muppandal
- d) Talcher

19)Which is the state with the highest energy consumption in India? * 1 point

- a) Andhra Pradesh
- b) Gujarat
- c) Maharashtra
- d) Tamil Nadu

13)The International Renewable Energy Agency (IRENA) was formed in * 1 point

- a) 2008
- b) 2009
- c) 2010
- d) 2011

34) Which one is true if after a voltage perturbation the Power drawn from the PV array decreases? * 1 point

- a) The operating point moved away from the MPP
- b) The operating point moved towards the MPP
- c) The voltage will have the same sign as the previous one.
- d) All of the above

45)An example of starch crops biomass Feedstocks is..... * 1 point

- a) wheat starch
- b) Orchard pruning's
- c) Sugarcane
- d) Corn stover

48)Estimate the annual energy production from a horizontal axis wind turbine with a 12 m diameter operating in a wind regime with an average wind speed of 8 m/s. Assume that the wind turbine is operating under standard atmospheric conditions (ρ = 1.225 kg/m3). Assume a turbine efficiency of 0.4. * 2 points

- a) 35KWh
- b) 35.46KWh
- c) 124,300KWh
- d) 14.184KWh

1)Which of the following energy has the greatest potential among all the sources of renewable energy? * 1 point

- a) Solar energy
- b) Wind Energy
- c) Thermal energy
- d) Hydro-electrical energy

26)In WECS operates at constant (or) nearly constant speed is also called as.....mode of operation. * 1 point

- a) VVVF
- b) CSVF
- c) VSVF
- d) CSCF

24)The speed of the turbine generators typically rotates at ..... * 1 point

- a) 1,000 to 1,200 rpm
- b) 1,200 to 1,800 rpm
- c) 500 to 1,000 rpm
- d) 1500 rpm

9)When the sun is directly on the top of head, it as referred to _____ * 1 point

- a) Zenith
- b) Azimuth
- c) Declination
- d) Hour angle

32) During ..... tides the water flow into the dam. * 1 point

- a) Low
- b) High
- c) Medium
- d) All the above

21)The blades of a wind turbine operates on the principle of .....just like airplane wings. * 1 point

- a) Wind velocity
- b) Wind pressure
- c) Lift
- d) Lift and drag

33) In tidal power plant ..... is a dam like structure used to capture the energy from masses of water moving in and out of bay. * 1 point

- a) Tidal barrage
- b) Slice gate
- c) Stream generator
- d) None of the above

49)India has 22 nuclear reactors in operation. * 1 point

- a) True
- b) False

Submit Clear form

IAT-1 MCQ's

EE8703-Renewable Energy Sources

* Required

1) Energy is released from fossil fuels when they are_____ * 1 point

- a) Pumped
- b) Cooled
- c) Burned
- d) Pressurized

2) Energy in the form of heat and light is obtained by_____ * 1 point

- a) Biomass
- b) Fossil fuels
- c) Sun
- d) Wind

3) Which of the following is not under the Ministry of New and Renewable Energy? * 1 point

- a) Wind energy
- b) Solar energy
- c) Tidal energy
- d) Large hydro
- Other:

4) Natural gas is a non-renewable energy. * 1 point

- a) True
- b) False

5) Total primary energy consumption of fuel in the world is lead by _____ * 1 point

- a) Coal
- b) Nuclear
- c) Hydro
- d) Oil

6) The products made from petroleum is..... * 1 point

- a) crayons
- b) photographic film
- c) steel
- d) platics

7) The main cause for Acid Rain is * 1 point

- a) Carbon dioxide
- b) Sulphur dioxide
- c) Methane
- d) None of the above

8) Non-Renewable resources are resources that are replenished by the environment over relatively short periods of time. * 1 point

- a) True
- b) False

9) Which country has the biggest coal reserves? * 1 point

- a) Russia
- b) US
- c) China
- d) India

10) Energy conservation act was formed in the year * 1 point

- a) 1998
- b) 1999
- c) 2000
- d) 2001

11) The energy sources that are available in the market for a definite price are known as..... * 1 point

- a) Primary source
- b) Commercial source
- c) Non-commercial source
- d) Renewable source

12) A module in a solar panel refers to * 1 point

- a) Series arrangement of solar cells.
- b) Parallel arrangement of solar cells
- c) Series and parallel arrangement of solar cells.
- d) None of the above.

13) The efficiency of the solar cell is about * 1 point

- a) 25 %
- b) 15 %
- c) 40 %
- d) 60 %

14) The current density of a photo voltaic cell ranges from * 1 point

- a) 10 – 20 mA/cm2
- b) 40 – 50 mA/cm2
- c) 20 – 40 mA/cm2
- d) 60 – 100 mA/cm2

15) A pyrometer is used for the measurements of * 1 point

- a) Diffuse radiations only.
- b) Direct radiations only.
- c) Both direct and diffused radiations.
- d) None of the above.

16) Reflector mirrors used for exploiting the solar energy are called * 1 point

- a) Mantle
- b) Heliostats
- c)Diffusers
- d) Ponds

17) The function of a solar collector is of converting solar energy into * 1 point

- a) Radiations
- b) Electrical energy directions
- c) Thermal energy
- d) All of these

18) What are pyrheliometers? * 1 point

- a) Instruments measures beam radiations
- b) Diffuse radiations.
- c) Direct radiations only
- d) None of the above

19) In a solar collector, why is the transparent cover provide for? * 1 point

- a) Protect the collector from dust
- b) Reduce the heat losses from collector beneath to atmosphere
- c) Transmit solar radiation only
- d) All of the above.

20) Most of the solar radiation received on earth surface lies within the range of..... * 1 point

- a) 0.2 to 0.4 microns
- b) 0.38 to 0.78 microns
- c) 0 to 0.38 microns
- d) 0.5 to 0.8 microns

21) The Sun's average surface temperature is about..... * 1 point

- a) 5670K
- b) 5760K
- c) 5706K
- d) 5076K

22) The amount of energy received by a surface over a given period of time is called..... 1 point

- a) Irradiation
- b) Insolation
- c) Solar radiation energy
- d) All the above

23) Solar radiation consist of range of particles, classified based on Wavelength * 1 point

- a) True
- b) False

24) The central Receiver Power system uses ..... * 1 point

- a)Linear receiver
- b) Linear receiver tubes
- c) Flat Conc.Mirrors
- d) None of the above

25) The working fluid for central Receiver Power system is..... 1 point

- a) Water & Molten salt
- b) Molten salt, Air & water
- c) Sodium & Themal oils
- d) All the above

26) ..... is one of the way that the storage of solar thermal energy can give better output. * 1 point

- a.) Collectors
- b) PCM
- c) Storage tank
- d) Receiver

27) The Thermal energy storage method is ..... * 1 point

- a) Sensible heat storage
- b) Water heat storage
- c) Battery storage
- d) Chemical storage

28) Voltage generated in a solar cell by a process called ..... * 1 point

- a) Hall effect
- b) Photovoltaic effect
- c) Zener effect
- d) None of the above

29) Full form of FF in the solar field is _____ 1 point

- a) Form factor
- b) Fill factor
- c) Face factor
- d) Fire factor

30) Material used for making solar cell is _____ * 1 point

- a) Silicon
- b) Carbon
- c) Sodium
- d) Magnesium

31) The output power of the centrifugal pump is proportional to the _____ of the speed. * 1 point

- a) Square
- b) Cube
- c) Square-root
- d) Cube-root

32) Full form of SSS is _____ * 1 point

- Option 1
- a) Saur Sujala Yojana
- b) Saur Solar Yojana
- c) Solar Sun Yojana
- d) Sun Sujala Yojana

33) The value of Solar Constant is * 1 point

- a) 1347 W/m2
- b) 1357 W/m2
- c) 1367 W/m2
- d) 1377 W/m2

34) The following is (are) laws of black body radiation. * 1 point

- a) Plank's law
- b) Stefan-Boltzmann law
- c) both (A) and (B)
- d) None of these

35) What should be the band gap of the semiconductors to be used as solar cell materials? * 1 point

- a) 0.5 eV
- b) 1 eV
- c) 1.5 eV
- d) 1.9 eV

36) Which of the following should not be the characteristic of the solar cell material? * 1 point

- a) High Absorption
- b) High Availability
- c) High Conductivity
- d) High Energy Band

37) Five 2 V cells are connected in parallel. The output voltage is * 1 point

- a) 1 V
- b) 1.5 V
- c) 1.75 V
- d) 2 V

38) The current produce by the solar cell can be given by _____ * 1 point

- a) IL – ID + ISh
- b) IL + ID – ISh
- c) IL + ID + ISh
- d) IL – ID – ISh

39) _____ photo voltaic devices in the form of thin films. * 1 point

- a) Cadmium Telluroide
- b) Cadmium oxide
- c) Cadmium sulphide
- d) Cadmium sulphate

40) MPPT stands for ..... * 1 point

- a) Maximum Peak Point Tracker
- b) Maximum Peak power Template
- c) Maximum Power Point Tracking
- d) Maximum Power Peak Tracking

41) The concept of P&O method is to modify the operating of ..... of the PV panel to obtain maximum power from it. * 1 point

- a) Voltage (or) Current
- b) Voltage (or) Power
- c) Current (or) Temperature
- d) None of the above

42) MPPT's are most effective under .....conditions * 1 point

- a) Winter/Cloudy/Hazy days
- b) Low battery charge
- c) Long Wire run
- d) All the above

43) ..... Represents the losses in a PV cell * 1 point

- a) Form Factor
- b) Fill Factor
- c) Force Factor
- d) Field Factor

44) The maximum solar cell efficiency is calculated at ..... * 1 point

- a) AM 0
- b) AM1
- c) AM1.5
- d) AM0.5

45) Major factor that affect the efficiency of solar power panel is ..... * 1 point

- a) Dusting
- b) Temperature rise effect
- c) Poor sunlight absorption
- d) All the above

46) For large commercial and utility scale solar systems, solar modules will have typically ..... solar cells * 1 point

- a) 36
- b) 72
- c) 24
- d) 48

47) To eliminate the hot-spot phenomenon, a .....is connected in parallel to the module or group of cell. * 1 point

- a) Bypass diode
- b) PIN diode
- c) Blocking diode
- d) Zener diode

48) India's installed solar power capacity as of June 2020 is * 1 point

- a) 28,181MW
- b) 21,651MW
- c) 34,627MW
- d) 12,289MW

49) Carbon dioxide is responsible for .....of the "enhanced greenhouse effect" * 1 point

- a) 50%
- b) 60%
- c) 70%
- d) 75%

50) The theme of Ministry of New & Renewable Energy in the republic day parade will be * 1 point

- a) Mega Watt To Giga Watt – Sustainable Power
- b) Mega Watt To Giga Watt – Land of Thousand Suns
- c) Mega Watt - Thousand Suns in India
- d) Mega Watt To Giga Watt – Making The Sun Brighter, Even At Night

Send me a copy of my responses.

Submit Clear for

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test – II			Date/ Session	03/11/2020 & FN	Marks	50
Course code	EE8703	Course Title	Renewable Energy Sources			
Batch No.		Duration	90 mins	Academic Year	2020-2021/ ODD	
Year	IV	Semester/ Section	VII / A & B	Department	EEE	

Part – A (20 Marks)

I. Choose the correct answer for the following Questions **(10 x 1 = 10marks)**

Q. No.	Questions	CO	Skills
1.(a)	"During the day, the air above the land heats up more quickly than the air over water". a) True , b) False	C205.5	U
1.(b)	Which part of the wind turbines senses wind speed, wind direction, shaft speed and torque? a) Turbine blade , b) Shaft, c) Rotor, d) Controller		U
2.(a)	Soft starters is used in SCIG based Wind Energy system to limit a) Speed b)Inrush current , c) Frequency, d)None of the above	C205.5	R
2.(b)	Which generator coupling is preferred in wind energy extraction? a. Permanent magnet synchronous generator b. Squirrel cage induction generator c. Doubly –fed induction generator d. None of the above		R
3.(a)	Which one of the following is an example of starch crops biomass feed stocks? a) Sugar cane , b) Wheat straw, c) Corn stover, d) Orchard prunings	C205.3	U
3.(b)	The _____ is made of bricks and cement mortar and it's inside wall are plastered with a mixture of cement and sand. a) Foundation , b) Digester, c) Gas holder, d) Inlet and outlet pipe		R
4.(a)	When the water is ejected from earth's interior in the form of hot water, it is called a) Geyser, b) Hot springs, c) Both a and b, d) None of the above.	C205.3	R
4.(b)	Flash geothermal power plants turns the high pressure hot water into _____ a) Low pressure hot water, b) Low pressure cool water c) High pressure hot water, d) High pressure hot water		R
5.(a)	Francis, kaplan and propeller turbines fall under the category of..... a) Impulse turbine, b) Reaction turbine, c) Impulse reaction combined, d) Axial flow		U
5.(b)	Gross head of a hydro power station is..... a) The difference of water level between the level in the storage and tail race. b) The height of the water level in the river where the storage is provided. c) The height of the water level in the river where the tail race is provided. d) None of the above.	C205.3	R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	What is meant by pitch control?	C205.5	U
7	Comparison between Horizontal and Vertical Axis wind turbine.	C205.5	R
8	Mention the extraction of energy from biomass.	C205.3	R
9	What is Geothermal energy?	C205.3	U
10	What is a Micro and Mini Hydro power plants?	C205.3	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	a) What are the main components of Horizontal Axis Wind turbine and explain in detail with a neat diagram. (6) b) Write short notes on grid connected issues of Wind Energy Generation. (4)	C205.2	U
	Or		
12	With a neat Block diagram explain the stand-alone operation of wind power plant.	C205.2	R
13	Explain with a neat diagram of Binary Cycle of Geothermal Power Generation.	C205.2	U
	Or		
14	Explain the fixed-dome Biogas gas power plant generation with a neat diagram.	C205.2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the components and working of micro Hydro power Generation with a neat diagram.	C205.2	U
	Or		
16	Explain the working of Francis turbine in Hydro power Generation.	C205.2	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Mr.M.Marimuthu AP/EEE & Ms. C.Pearline Kamalini AP/EEE

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test - I			Date/Session	12-09-2020 /FN	Marks	50
Course code	EE8301	Course Title	Electrical Machines - I			
Batch No.		Duration	90 Mins	Academic Year	2020-2021/ODD	
Year	II	Semester	III	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

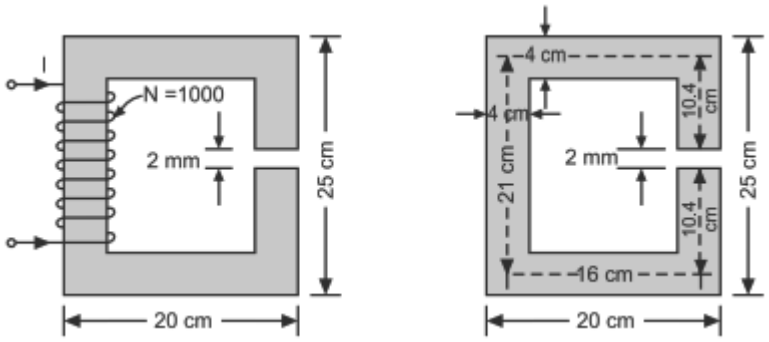
Q. No.	Questions	CO	Skills
1.(a)	Relative permeability of vacuum is, (a) $4\pi\times10^{-7}$ H/m (b) 1 H/m (c) 1 (d) 1/4 π	C204.1	R
1.(b)	While comparing magnetic and electric circuits, the flux of magnetic circuit is compared with which parameter of electrical circuit? (a) EMF (b) Current (c) Current density (d) Conductivity		U
2.(a)	The unit of reluctance is (a) Meter/Henry (b) Henry/meter (c) Henry (d) 1/Henry	C204.1	R
2.(b)	coil of 1000 turns is wound on a core. A current of 1 A flowing through the coil creates a core flux of 1 mWb. The energy stored in the magnetic field is (*a*) 0.25 J (*b*) 0.5 J (*c*) 1 J (*d*) 2 J		AZ
3.(a)	Laminated cores, in electrical machines, are used to reduce (a) Copper loss, (b) Eddy current loss, (c) Hysteresis loss, (d) All of the above.	C204.1	A
3.(b)	A 2 cm long coil has 10 turns and carries a current of 750 mA. The magnetising force of the coil is (*i*) 225 AT/m (*ii*) 675 AT/m (*iii*) 450 AT/m (*iv*) 375 AT/m		AZ
4.(a)	If the area of hysteresis loop of a material is large, the hysteresis loss in this material will be (A) Zero (B) Small (C) Large (D) None of the above	C204.1	R
4.(b)	Permanent magnets are normally made of, (a) Aluminium (b) Wrought iron (c) Cast iron (d) Alnico alloys		R
5.(a)	Those magnetic materials are best suited for making armature and transformer cores which have _____ permeability and _____ hysteresis loss. (A) High, high (B) Low, high (C) High, low (D) Low, low	C204.1	AZ
5.(b)	Which law specifies that the current induced in a coil opposes the cause of it? (a) Faraday's law (b) Lenz's law (c) Fleming's left hand rule (d) Fleming's right hand rule.		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	Define leakage flux.	C204.1	U
7	State Ampere's law.	C204.1	R
8	Give the expression for hysteresis losses and eddy current losses.	C204.1	R
9	What is the important property of Delta-max cores?	C204.1	A
10	How are hysteresis and eddy current losses minimized?	C204.1	A

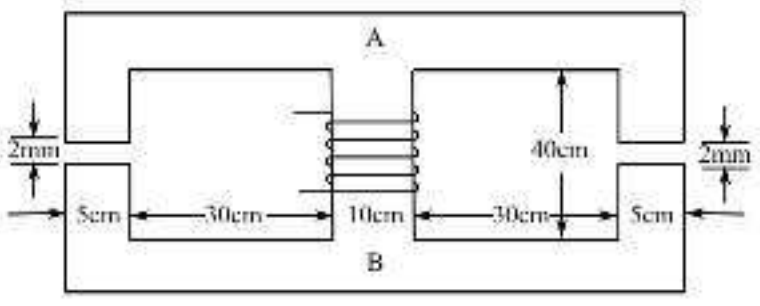
Part – B

(Answer all the questions 2 × 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive the expression for self inductance and mutual inductance and also for coefficient of coupling.	C204.1	AZ
	Or		
12	An iron rod of 1.8 cm diameter is bent to form a ring of mean diameter 25 cm and wound with 250 turns of wire. A gap of 1 mm exists in between the end faces. Calculate the current required to produce a flux of 0.6 mWb. Take relative permeability of iron as 1200.	C204.1	A
13	Summerize the properties of magnetic materials.	C204.1	R
	Or		
14	A rectangular magnetic core shown in Fig. 14. has square cross-section of area 16 cm^2. An air-gap of 2 mm is cut across one of its limbs. Find the exciting current needed in the coil having 1000 turns wound on the core to create an air-gap flux of 4 mWb. The relative permeability of the core is 2000.  Fig.14. Magnetic Circuit	C204.1	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	For the magnetic circuit shown in Fig.15, with a core thickness of 5 cm, exciting current of 0.5A wound with 1000 turns coil, find the flux density and flux in each of the outer limbs and the central limbs. Assume relative permeability for iron of the core to be (a) infinity, (b) 4500. 	C204.1	AZ
	Or		
16	The total core loss of a specimen of silicon steel is found to be 1500 W at 50 Hz. Keeping the flux density constant, the loss becomes 3000W when the frequency is raised to 75 Hz. Calculate separately the hysteresis and eddy current loss at each of those frequencies.	C204.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: P.RAMESH BABU/Dept. of EEE

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test - II			Date/Session	06-10-2020 /AN	Marks	50
Course code	EE8301	Course Title	Electrical Machines - I			
Batch No.		Duration	90 Mins m	Academic Year	2020-2021/ODD	
Year	II	Semester	III	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.(a)	The changes in volume of transformer cooling oil due to variation of atmospheric temperature during day and night is taken care of by which part of transformer (i) Conservator(ii) Breather(iii) Bushings(iv) Buchholz relay	C204.2	R
1.(b)	The voltage transformation ratio of a transformer is equal to the ratio of (i) Primary turns to secondary turns (ii) Secondary current to primary current (iii) Secondary induced e.m.f. to primary induced e.m.f. (iv) Secondary terminal voltage to primary applied voltage		U
2.(a)	A 3:1 transformer has impedance of (1+j5) Ω on L.V side and (9+j45) Ωon the H.V side. The total equivalent impedance at the H.V terminal is (i) 18+j90 Ω (ii) 2+j10 Ω (iii) 10 +j50 Ω (iv) 8 +j40 Ω	C204.2	R
2.(b)	In a single phase transformer, with subscripts 1 and 2 for primary and secondary windings (i) $E_1N_2 = E_2N_1$ and $I_1N_1 = I_2N_2$ (ii) $E_1N_1 = E_2N_2$ and $I_1N_1 = I_2N_2$ (iii) $E_1N_2 = E_2N_1$ and $I_1N_2 = I_2N_1$ (iv) $E_1N_1 = E_2N_2$and $I_1N_2 = I_2N_1$		AZ
3.(a)	Transformer action requires a (i) Constant magnetic flux (ii) increasing magnetic flux (iii) alternating magnetic flux (iv) alternating electric field	C204.2	A
3.(b)	When a 200 Ω load resistor is connected across the secondary winding of a transformer with a turns ratio of 4, the source "sees" a reflective load of (i) 50 Ω (ii) 12.5 Ω (iii) 800 Ω (iv) 0 Ω		AZ
4.(a)	The energy storing capacity of magnetic field is about _____ times greater than that of electric field. a) 50,000 b) 25,000 c) 10,000 d) 40,000	C204.3	R
4.(b)	When a current of 5A flows through a coil of a linear magnetic circuit, it has flux linkages of 2.4 wb-turns. What is the energy stored in the magnetic field of this coil in Joules? (A) 1.2 (B) 2.4 (C) 6 (D) 24		R
5.(a)	Which component of torque in the following equation is called the electromagnetic torque of electromagnetic energy conversion device? $Te=1/2\ i_s^2\ dLs/d\theta r + 1/2\ I_r^2\ dLr/d\theta r + I_s\ I_r\ dMsr/d\theta r$ (A) $1/2\ i_s^2\ dLs/d\theta r$ (B) $1/2\ I_r^2\ dLr/d\theta r$ (C) $I_s\ I_r\ dMsr/d\theta r$ (D) all of the above	C204.3	AZ
5.(b)	Which of the following are examples of doubly-excited magnetic systems? (A) Synchronous Machines (B) Loudspeakers and Tachometers (C)D.C Shur Machines (D) All of the mentioned		R

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
6	What happens if DC supply is applied to the transformer? Transformers are rated in kVA- why?	C204.2	U
7	What is the condition for maximum efficiency of transformer and condition for load current at maximum efficiency of transformer?	C204.2	R
8	Draw an approximate equivalent circuit of transformer referred to primary side and draw the phasor diagram of transformer on no load condition	C204.2	R
9	What is singly excited and multi excited magnetic field system?	C204.3	A
10	Define field energy and co-energy.	C204.3	A

Part – B

(Answer all the questions 2 × 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(a) A 10 kVA; 500/250 V, 50 Hz, single phase transformer has a net area of cross section is 90 cm^2 and maximum flux density is 1.2T. Calculate the number of turns on both primary and secondary.**(5 marks)** (b) A single phase 50Hz transformer has 80 turns on the primary winding and 280 turns on secondary winding. The voltage across the primary winding is 240 V at 50Hz. Calculate (i) the maximum flux density in the core and (ii) induced emf in core. The net cross sectional area of the core be taken 200 cm^2. **(5 marks)**	C204.2	AZ
	Or		
12	**(a)** Develop an equivalent circuit of transformer with step by step procedure.**(5 marks)** **(b)** A 10 kVA, 500/100 V transformer has the following circuit parameters referred to primary resistance R_{01}= 0.3 **Ω**, reactance X_{01} = 5.2 **Ω**. When supplying power to a lagging load, the current, power and voltage measured on primary side were 20A, 8 kW and 500V respectively. Calculate voltage on secondary terminals under these conditions**(5Marks)**	C204.2	A
13	**(a)** Explain the following in singly excited system (i) Electrical energy input (ii) magnetic field energy stored (iii) filed energy and co-energy (iv) energy density and co energy density **(5Marks)** **(b)** Derive an expression for force and torque in singly excited system for linear and rotary motion of armature. **(5 marks)**	C204.3	R
	Or		
14	Derive an expression for field energy stored and torque in doubly excited system.	C204.3	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

15 (a) Tests are performed on 1Φ ,10kVA, 2200/220V, 60 Hz transformer and the following results are obtained

Meter's reading	O.C Test (H.V side Open)	S.C Test (L.V side Short circuited)
Voltmeter Ammeter Wattmeter	220 V 2.5A 100 W	150V 4.55A 215W

(a) Determine the parameters for approximate equivalent circuit referred to HV side. (b) Determine the voltage regulation in percent for 50% full load 0.8 pf lagging. (c) Efficiency at 50% rated output and p.f 0.8

15 (b) Define all day efficiency of transformer. Find the all-day efficiency of 500mkVA, distribution transformer whose copper loss and iron loss at full load are 4.5 kW and 3.5 kW respectively. During a day of 24 hours, it is loaded as under

No. of operating hours	Load in kW	Power factor
6	400	0.8
10	300	0.75
4	100	0.8
4	0	-

(or)

16 (a)

Tests are performed on 1Φ ,10kVA, 2200/220V, 60 Hz transformer and the following results are obtained

Meter's reading	O.C Test (H.V side Open)	S.C Test (L.V side Short circuited)
Voltmeter Ammeter Wattmeter	220 V 2.5A 100 W	150V 4.55A 215W

(a) Determine the parameters for approximate equivalent circuit referred to LV side. (b) Determine the voltage regulation in percent for 75% full load 0.6 pf lagging. (c) Efficiency at 75% rated output and p.f 0.6

16 (b) A transformer with normal voltage impressed has a flux density of 1.2 T and core loss comprising 1200W eddy current loss and 3500 W hysteresis loss what do those losses become under the following conditions
(i) Increasing the applied voltage by 5% at rated frequency (ii) reducing the frequency by 5% with normal voltage impressed and (iii) Increasing both impressed voltage and frequency by 5%

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: P.RAMESH BABU/Dept. of EEE

2020-2021 - EVEN SEMESTER

INTERNAL ASSESSMENT QUESTION

PAPERS

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date	14-03-20	Marks	50
Course code	BE 8251	Course Title	Basic Electrical and Electronics Engineering			
Batch No.		Duration	90 mins	Academic Year	2019 - 2020	
Year	I	Semester/Section	II / A	Department	Civil	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define the term doping.	C112.3	R
2	Define depletion layer.	C112.3	R
3	Define voltage regulation.	C112.3	E
4	State the applications of BJT.	C112.3	R
5	Define rectifier.	C112.3	U
6	Give the application of zener diode.	C112.3	E
7	What are classification of single phase induction motor.	C112.2	E
8	Define slip in induction motor.	C112.2	E
9	Distinguish between core and shell type transformer.	C112.2	R
10	Write the application of dc shunt motor.	C112.2	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q. No.	Questions	CO	Skills
11	Derive the emf equation of a dc generator.	C112.2	E
	or		
12	Explain the working principle of various types of single phase induction motor with neat circuit diagram	C112.2	E
13	Explain the operation of zener diode with required circuit and characteristics	C112.3	E
	or		
14	Explain the operation of full wave rectifiers with relevant waveforms	C112.3	E
15	Explain how you will obtain the static characteristics of common emitter configuration	C112.3	R
	or		
16	Explain the working of CE configuration of a BJT and draw its input, output characteristics.	C112.3	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date	30-06-2021	Marks	50
Course code	BE 8251	Course Title	Basic Electrical and Electronics Engineering			
Batch No.		Duration	90 mins	Academic Year	2020- 2021	
Year	I	Semester/Section	II / A	Department	Civil	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define baising.	C112.3	R
2	Define full wave rectifier.	C112.3	R
3	Define voltage regulation.	C112.3	E
4	State the applications of PN junction diode.	C112.3	R
5	Define registers.	C112.4	U
6	Give the application of flip flops	C112.4	E
7	Write the truth table for OR gate.	C112.4	E
8	Find the binary values for the decimal number 45.	C112.4	E
9	Distinguish between counters and registers.	C112.4	R
10	Write the application of analog to digital converters.	C112.4	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain about different logic gates along with Truth table.	C112.4	E
	Or		
12	Explain the working principle of various types of analog to digital converters with neat diagram.	C112.4	E
13	Explain the operation of any three types flip flops with neat diagram.	C112.4	E
	Or		
14	Explain the operation of half wave and full wave rectifiers with relevant waveforms	C112.4	E
	Part –c (1x10= 10)		
15	Explain the operation of full wave rectifiers with relevant waveforms	C112.3	R
	Or		
16	Explain the working of CE configuration of a BJT and draw its input, output characteristics.	C112.3	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/ Session	30/06/2021	Marks	50
Course code	BE8255	Course Title	BASIC ELECTRICAL, ELECTRONICS & MEASUREMENT ENGINEERING			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	I	Semester/ Section	II / A&B	Department	CSE & IT	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Mention any five characteristics of an ideal Op-amp.	C110.5	U
2	Draw the circuit diagram of Op-amp as an Integrator and write its output voltage.	C110.5	U
3	What is an inverting amplifier?	C110.5	R
4	List the features of IC 555 timer.	C110.5	R
5	Draw the pin diagram of Monostable multivibrator.	C110.5	R
6	Write about LM723 General purpose regulator.	C110.5	U
7	List out the dynamic characteristics of any measuring system.	C110.6	U
8	Define the term: i) Precision & ii) Sensitivity.	C110.6	U
9	Define gauge factor.	C110.6	R
10	What are the basic requirements of a transducer?	C110.6	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q.No.	Questions	CO	Skills
11	Explain in detail about i) Binary Weighted Resistor DAC & ii) Successive Approximation Method ADC.	C110.5	U
	Or		
12	Explain in detail about i)Hartley Oscillator & ii) Phase shift Oscillator	C110.5	U
13	Explain the construction and working principle of PMMC Instrument and also derive the torque equation.	C110.6	E
	Or		
14	Discuss in detail about the construction and working principle of Induction type Energy Meter.	C110.6	R

Part – C (1 x 10 = 10marks)

15	Explain the construction and principle of walking of a LVDT. Explain how the magnitude and different of displacement of core of an LVDT detected.	C110.6	R
	Or		
16	Explain the various parts and operation of CRO with a neat diagram.	C110.6	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name: Dr.S.Vijayalakshmi (CSE-A-sec), Mrs.C. Pearline kamalini (CSE-B-sec) & Mr.P.Rameshbabu (IT)

EE8602-PSG IAT1 on 30.3.21

The respondent's email (**null**) was recorded on submission of this form.
*Required

1. Email *

2. Year/Sem/Sec *

3. Student's Name

4. Batch Number

Part A

5. A protective relay is a device that_____ * 1 point

Mark only one oval.

- detects the fault
- initiates the operation of the circuit breaker
- detects the fault and initiates the operation of the circuit breaker
- disconnect the faulty section in the power system

6. A relay used on short transmission lines is * 1 point

Mark only one oval.

- Reactance Relay
- Mho's Relay
- Impedance Relay
- None of these

7. The electrical quantities which may change under fault conditions is ---------- * 1 point

Mark only one oval.

- resistance
- impedance
- frequency
- reactance

8. Second part of the relay circuit consists of ..... * 1 point

Mark only one oval.

- secondary winding of current transformer and the relay operating coil
- secondary winding of a potential transformerand the relay operating coil
- primary winding of a current transformerand the relay operating coil
- primary winding of a potential transformerand the relay operating coil

9. _____ is the ability of the relay system to operate with low value of actuating quantity * 1 point

Mark only one oval.

- selectivity
- Sensitivity
- reliability
- simplicity

10. The reliability of protective scheme should at least be * 1 point

Mark only one oval.

- 90
- 95
- 85
- 80

11. The Unit protection depends on the correct coordination of ---------- * 1 point

Mark only one oval.

- current transformers and circuit breakers
- current transformers and relays
- Voltage transformers and circuit breakers
- Voltage transformers and relays

12. The Earth Fault Protection applied to the ---------- * 1 point

Mark only one oval.

- high voltage delta winding of a power transformer
- low voltage delta winding of a power transformer
- low voltage star winding of a power transformer
- high voltage star winding of a power transformer

13. Thermal relays utilize the _____ for their operation * 1 point

Mark only one oval.

- electro-thermal effect of the actuating current
- electro-thermal effect of the actuating voltage
- electro-thermal effect of the actuating power
- electro-thermal effect of the actuating energy

14. Non-unit Protection Scheme measures _____ into the protection operation * 1 point

Mark only one oval.

- voltage and incorporates an inverse time characteristic
- current and incorporates an inverse time characteristic
- power and incorporates an inverse time characteristic
- energy and incorporates an inverse time characteristic

15. Distance protection is used for the protection of ..... * 1 point

Mark only one oval.

- 330 kV lines
- 33 kV lines
- 660 kV lines
- 440 V line

16. In case of bus zone protection, * 1 point

Mark only one oval.

- CTs are placed on the both sides of the bus bar
- VTs are placed on the both sides of the bus bar
- CTs are placed on any one side of the bus bar
- VTs are placed on any one side of the bus bar

17. The standard current ratings of the secondary windings of the current transformers (CTs) are -- * 1 point

Mark only one oval.

- 4 or 2 ampere
- 6 or 3 ampere
- 5 or 1 ampere
- 10 or 1 ampere

18. The voltage ratings of the protective relays and meters are same as the voltage ratings of the * 1 point

Mark only one oval.

- primary windings of the CTs
- secondary windings of the CTs
- primary windings of the VTs
- secondary windings of the VTs

19. The CT burden is defined as the _____ across its secondary * 1 point

Mark only one oval.

- voltage
- load connected
- reactive power
- pickup current

20. Voltage transformers are used to physically isolate the relays and other instruments (meters) from the _____. * 1 point

Mark only one oval.

- high voltages of the power system
- low voltages of the power system
- high fault current of the power system
- transient current of the power system

21. The driving torque in the shaded pole structure relay is proportional to the _____. * 1 point

Mark only one oval.

- Secondary voltage of CT
- primary current in CT
- square of current in the relay coil
- square of the voltage across relay coil

22. Induction cup structure relay has very high speed and may have an operating time_____ * 1 point

Mark only one oval.

- between 0.25 and 0.3 seconds
- between 0.15 and 0.2 seconds
- between 0.35 and 0.4 seconds
- between 0.05 to 0•1 second

23. A thermal protection switch can protect against------ * 1 point

Mark only one oval.

- Short-circuit
- Overload
- Temperature
- Overvoltage

24. Arc in a circuit behaves as----- * 1 point

Mark only one oval.

- A capacitive reactance
- An inductive reactance
- A resistance increasing with voltage rise across the arc
- A resistance decreasing with voltage rise across the arc

25. The thermal circuit breaker has * 1 point

Mark only one oval.

- Delayed trip action
- Instantaneous trip action
- Instantaneous short action
- Any of the above

26. Relays can be designed to respond to changes in * 1 point

Mark only one oval.

- Resistance, reactance or impedance
- Voltage and current
- Temperature
- All of the above

27. Overload relays are of _____ type * 1 point

Mark only one oval.

- Solid state
- Thermal
- Electromagnetic
- All of the above

28. Thermal overload relays are used to protect the motor against over current due to * 1 point

Mark only one oval.

- Short-circuits
- Heavy loads
- Grounds
- All of the above

29. The function of the circuit breaker is..... * 1 point

Mark only one oval.

- To safeguard the circuit
- On and off the circuit
- To save human life
- None of these

30. In order that current should flow without causing excessive heating or voltage drop, therelay contacts should * 1 point

Mark only one oval.

- ◯ Have low contact resistance
- ◯ Be clean and smooth
- ◯ Be of sufficient size and proper shape
- ◯ Have all above properties

31. An efficient and well designed protective relaying should have * 1 point

Mark only one oval.

- ◯ Good selectivity and reliability
- ◯ Economy and simplicity
- ◯ High speed and selectivity
- ◯ All of the above

32. Directional relays are based on the flow of---- * 1 point

Mark only one oval.

- ◯ Power
- ◯ Current
- ◯ Voltage Wave
- ◯ None of the above

33. A differential relay measures the vector difference between---- * 1 point

Mark only one oval.

- ◯ Two current
- ◯ Two voltage
- ◯ Two similar quantities
- ◯ Any of the above

34. Protective relays are devices that detect abnormal conditions in electrical circuits by measuring * 1 point

Mark only one oval.

- ◯ Current during abnormal condition
- ◯ Voltage during abnormal condition
- ◯ Constantly the electrical quantities which differ during normal and abnormal conditions
- ◯ None of the above.

Part B

35. Plug setting of a electromagnetic relay can be altered by varying * 2 points

Mark only one oval.

- ◯ Number of ampere turns
- ◯ Air gap of magnetic path
- ◯ Adjustable back stop
- ◯ None of these

36. Resistance grounding is used for voltage between * 2 points

Mark only one oval.

- ◯ 33kV to 66kV
- ◯ 2.2 kV to 33 kV
- ◯ 3.3 kV to 11 kV
- ◯ All of the above

37. The underground neutral transmission system is not recommended because ofthe system * 2 points

Mark only one oval.

- ◯ Insulation being overstressed due to overvoltages
- ◯ Insulation overstress may lead to failure and subsequent phase to phase faults
- ◯ Being inadequately protected against ground fault
- ◯ All of the above

38. Short-circuit currents are due to * 2 points

Mark only one oval.

- Single phase to ground faults
- Phase to phase faults
- Two-phase to ground faults
- Three phase faults
- Any of these

39. A mho relay is used for protection of * 2 points

Mark only one oval.

- Protection of a transformer against external fault
- Long Transmission Line
- Protection of a transformer against all the internal faults and external fault
- Medium Length lines

40. A relay which measures impedance or a component of the impedance at the relay location is known as * 2 points

Mark only one oval.

- Induction Relay
- Moving Coil Relay
- Distance relay
- All the above

41. When the fault current is 2000 A, for a relay setting of 50% with CT ratio 500/5, the plug setting multiplier will be * 2 points

Mark only one oval.

- 16
- 14
- 12
- 8

42. Admittance relay is _____ relay * 2 points

Mark only one oval.

- Impedance
- Distance
- Directional
- None of the above

43. If the fault occurs near the impedance relay, the VI ratio will be * 2 points

Mark only one oval.

- Constant for all distances
- Lower than that of if the fault occurs away from the relay
- Higher than that of if the fault occurs away from the relay
- None of the above

44. The torque produced in induction type relay (shaded pole structure) is * 2 points

Mark only one oval.

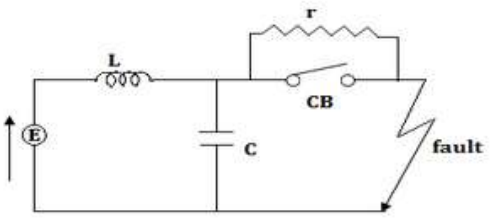
- Inversely proportional to the current
- Inversely proportional to the square of the current
- Proportional to the current
- Proportional to the square of the current

45. Discrimination between main and back up protection is provided by the use of relays which are * 2 points

Mark only one oval.

- fact
- slow
- sensitive
- none of the above

46. In the following figure, which component ensures the safety of the line from damage? * 2 points



Mark only one oval.

- Relay
- Circuit breaker
- Bus bar
- Current Transformer

47. What is the actuating quantity for the relays? * 2 points

Mark only one oval.

- Magnitude
- Frequency
- Phase angle
- All of these

48. A three phase, 33 kV oil circuit breaker is rated 1200 A, 2000 MVA, 3s. What is its symmetrical breaking current? * 2 points

Mark only one oval.

- 1200 A
- 500 A
- 35 kA
- 104.28 KA

49. The most efficient torque producing actuating structure for the induction type relays is * 2 points

Mark only one oval.

- Induction cup structure
- shaded pole structure
- Watt hour meter Structure
- Single induction loop structure

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	29.04.2021/ FN	Marks	50
Course code	EI8451	**Course Title**	Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2020-2021	
Year	II	**Semester/ Section**	IV/A	**Department**	ICE	

Part – A

(Answer all the questions 5 x 2 = 10 marks)

Q. No.	Questions	CO	Skills
1	A 200 kVA single phase transformer with a voltage ratio of 6600 / 660 V has the following winding parameters. $R_1 = 1.56\Omega$, $R_2 = 0.016\Omega$, $X_1 = 4.67\Omega$ and $X_2 = 0.048\Omega$. Calculate the resistance and reactance referred to high voltage side.	C210.2	A
2	Full load copper loss in a transformer is 2000 watts. What will be the loss at half load ?	C210.2	A
3	Calculate the value of the distribution factor for a 3-phase, 4-pole Alternator having 36 slots.	C210.3	A
4	The effective resistance of a 2200V, 50Hz, 440 kVA, 1-phase Alternator is 0.5 Ω. On short circuit, a field current of 40A gives the full load current of 200A. The voltage on open circuit with same field excitation is 1160V. Claculate (i) Synchronous impedance (ii) Synchronous reactance.	C210.3	A
5	Calculate the minimum and maximum number of Poles required for a Salient pole Synchronous motor having minimum and maximum speeds of 150 rpm and 1500 rpm respectively.	C210.3	A

Part – B

(Answer all the questions 5 x 8 = 40 marks)

Q. No.	Questions	CO	Skills
6	In a Transformer, core loss is found to be 52 W at 40Hz and 90 W at 60Hz, both losses being measured at the same peak flux density. Compute the Hysteresis and Eddy Current Losses at 50Hz.	C210.2	AZ
	Or		
7	The parameters of a 2300V/230V, 50Hz transformer are $R_1 = 0.286\ \Omega$, $R_2 = 0.39\ \Omega$, $R_0 = 250\ \Omega$, $X_1 = 0.73\ \Omega$, $X_2 = 0.73\ \Omega$, and $X_0 = 1500\ \Omega$. The secondary load impedance $Z_L = 0.37+j\ 0.29$. Solve for input current, Secondary current referred to primary, No-load current, Input Power factor, Primary Copper Loss, Secondary Copper Loss, efficiency and regulation from the exact equivalent circuit with normal voltage across the primary.	C210.2	AZ
8	A 5kVA, single phase Transformer has a core loss of 40W and full load ohmic (copper) loss of 100W. The daily variation of load on the Transformer is as follows: 7 A.M to 1 P.M – 2kW at 0.8 pf lag 1 P. to 6 P.M – 3kW at 0.6 pf lag 6 P.M to 1 A.M – 6kW at 0.9 lag 1 A.M – 7 A.M – No Load Calculate the all day Efficiency of the Transformer.	C210.2	AZ
	Or		
9	The primary and secondary windings of a 30 kVA 7600/230V, 1-phase Transformer has a resistance of 10 Ω and 0.016 Ω respectively. The reactance of the Transformer referred to primary is 34 Ω. Calculate the primary voltage required to circulate the full-load current when the secondary is short circuited.	C210.2	AZ
10	A 220V, 50 Hz, 6 pole star-connected alternator with ohmic resistance of 0.06 Ω per phase, gave the following data for open circuit, short circuit tests.	C210.3	AZ

Filed Current, If	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.8	2.2
Open Circuit	29.0	58.0	87.0	116	146	172	194	232	261.5

		Voltage, V_{OC} in V										
		Short Circuit Test I_{SC} in A	6.6	13.2	20.0	26.5	32.4	40.0	46.3	59.0	--	
	Find the percentage voltage regulation at full-load current of 40A at 0.8 p.f (lagging) by EMF method.											
	Or											
11	For the Alternator parameters given in Q.No. 10, Find the percentage voltage regulation at full-load current of 40A at 0.8 p.f (lagging) by EMF method.										C210.3	AZ
12	A 4-pole, 50 Hz, star connected alternator has 15 slots per pole and each slot has 12 conductors. All the conductors of each phase are connected in series the winding factor being 0.96.cWhen running on no-load for a certain flux per pole, the terminal EMF was 1825V. If the windings are wave-connected as in DC machine, what would be the EMF between the brushes for the same speed and same flux/pole. Assume sinusoidal distribution of flux.										C210.3	AZ
	Or											
13	A 3-phase, 16 pole alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux/pole is 0.04 Wb (sinusoidal) and the speed is 375 rpm. Find the frequency, phase and Line EMFs. The total turns/phase may be assumed to series connected.										C210.3	AZ
14	A 400V, 6 pole, 3-phase, 50Hz, star connected synchronous motor has a resistance and synchronous impedance of 0.6 Ω and 4.5 Ω per phase respectively. It takes a current of 14 A at unity power factor when operating with a certain field current. If the load torque is increased until the line current is increased to 50 A, the field current remaining unchanged, Calculate: (a) New Power factor and (b) Gross torque developed.										C210.3	AZ
	Or											
15	A 6.6 kV, Star-connecred, 3-phase, synchronous motor works at constant voltage and constant excitation. Its synchronous impedance is 2+j20 per phase. When the input is 1000 kW, its power factor is 0.8 leading. Find the power factor when the input is increased to 1500 kW.										C210.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.P.Ram Prakash, AP/EEE

EI8451-IAT-1

EI8451 - Electrical Machines - Internal Assessment Test-1

The respondent's email (**null**) was recorded on submission of this form.
*Required

1. Email *

2. Name of the Student *

3. Batch Number *

4. Year / Semester / Section *

Mark only one oval.

- II Year / IV Semester / ICE - A Section

PART-A

30*1 = 30 Marks

5. If the back emf of a dc motor suddenly vanishes * 1 point

Mark only one oval.

- a) The motor will run faster
- b) The motor will start hunting the efficiency of the motor will increase
- c) The motor will start hunting
- d) The motor will burn out

6. In dc motor , which of the following part can withstand the maximum rise in temperature? * 1 point

Mark only one oval.

- a) Armature winding
- b) Field winding
- c) Commutator winding
- d) Slip rings

7. Two dc series motor are coupled. One motor runs as generator and the other as motor . The friction losses of the two machines will be equal when * 1 point

Mark only one oval.

- a) Both operate at same voltage
- b) Both have same back emf
- c) Both have same speed
- d) Both have same excitation

8. The brush voltage drops in dc in / of the order of * 1 point

Mark only one oval.

- a) 2 V
- b) 10 V
- c) 20 V
- d) 40 V

9. The shaft torque of a dc motor is less than its armature torque because of * 1 point

Mark only one oval.

- a)Copper losses
- b) Mechanical losses
- c) Back emf
- d) Rotational losses

10. Direction of rotation of motor is determined by _____ * 1 point

Mark only one oval.

- a) Faraday's law
- b) Lenz's law
- c) Coulomb's law
- d) Fleming's left-hand rule

11. In DC machines the residual magnetism is present. The order of residual magnetism is _____ * 1 point

Mark only one oval.

- a) 2 to 3 per cent
- b) 10 to 15 per cent
- c) 20 to 25 per cent
- d) 50 to 75 per cent

12. A three-point starter is used for _____ * 1 point

Mark only one oval.

- a) Shunt as well as compound motors
- b) Shunt, compound and series motors
- c) Not for DC motors
- d) Shunt motors

13. If the speed of a DC shunt motor is increased, the back emf of the motor will _____ * 1 point

Mark only one oval.

- a) Increase
- b) Decrease
- c) Remain same
- d) Become zero

14. What is Self-excitation in DC shunt generator? * 1 point

Mark only one oval.

- a) Field winding is connected in series of armature
- b) Field winding is connected in parallel of armature
- c) Field winding is not connected to the armature
- d) Field Winding is not excited

15. For a self-excited DC shunt generator Ia = _____ * 1 point

Mark only one oval.

- a) IL − If
- b) IL + If
- c) − IL − If
- d) − IL + If

16. No-load voltage observed at two different field resistance values, is V1 < V2. What will be the relation in speed if field resistance is kept same for both cases? * 1 point

Mark only one oval.

- a) N 1 < N 2
- b) N 1 = N 1
- c) N 1 > N 1
- d) Can't determine from no-load voltage

17. Characteristics of separately excited DC generator are drawn by keeping _____ * 1 point

Mark only one oval.

- a) Field current and speed both constant
- b) Field current and speed both variable
- c) Field current constant and speed variable
- d) Field current variable and speed constant

18. Which of the following characteristic lies above of all others? * 1 point

Mark only one oval.

- a) Differential compound
- b) Under compound
- c) Level compound
- d) Over compound

19. Armature winding is mounted on a _____ * 1 point

Mark only one oval.

- a) Stator
- b) Rotor
- c) Can be mounted anywhere on stator or rotor
- d) Not required

20. What are the materials used for brushes in dc machines? * 1 point

Mark only one oval.

- a) Iron
- b) Carbon
- c) Aluminum
- d) steel

21. Which of the following load application normally needs starting torque more than the rated torque? * 1 point

Mark only one oval.

- a) Blowers
- b) Conveyors
- c) Air compressors
- d) Centrifugal pumps

22. Separately excited DC generators are still used in _____ * 1 point

Mark only one oval.

- a) Thermal power plants
- b) Ward Leonard speed control system
- c) Hydro power plant
- d) In all fields

23. In a DC machine, rectification provided with commutator is _____ * 1 point

Mark only one oval.

- a) Half wave rectification
- b) Full wave rectification
- c) Semi controlled rectification
- d) Uncontrolled rectification

24. For a constant emf, if field current is reduced then the speed of the DC motor will_____ * 1 point

Mark only one oval.

- a) Remains same
- b) Increases
- c) Decreases
- d) Can't say

25. A Transformer will work on * 1 point

Mark only one oval.

- a) AC only
- b) DC only
- c) AC and DC
- d) None of the Above

26. The voltage per turn of the primary of a transformer is _____the voltage per turn of the secondary, * 1 point

Mark only one oval.

- a) more than
- b) Less than
- c) equal to
- d) None of the Above

27. The magnetic flux in the core of a single phase Transformer is * 1 point

Mark only one oval.

- a) Purely Rotating
- b) Purely Alternating
- c) Partly Rotating and Partly Alternating
- d) None of the Above

28. The primary and secondary of a transformer are _____ coupled * 1 point

Mark only one oval.

- a) electrically
- b) magnetically
- c) electrically and magnetically
- d) None of the Above

29. An ideal Transformer is one which * 1 point

Mark only one oval.

- a) has no losses and leakage reactance
- b) does not work
- c) has the same number of primary and secondary turns
- d) Both (a) and (c)

30. A Transformer does not possess _____ changing property * 1 point

Mark only one oval.

- a) Voltage
- b) Current
- c) Power
- d) Impedance

31. Open circuit Test is normally conducted in * 1 point

Mark only one oval.

- a) High voltage Side
- b) Low Voltage Side
- c) Primary
- d) Secondary

32. The approximate efficiency of a Large Transformer is * 1 point

Mark only one oval.

- a) 65%
- b) 85%
- c) 90%
- d) 95%

33. A Transformer will have zero efficiency at _____ * 1 point

Mark only one oval.

- a) full load
- b) no load
- c) half load
- both full load and no load

34. The transformation ratio of a Transformer is 1 point

Mark only one oval.

- V1 / V2
- N1 / N2
- i1 / i2
- E1 / E2

PART-B

15*2 = 30 Marks

35. Speed regulation of a DC shunt motor is equal to 10%, at no load speed of 1400 rpm. What is the full load speed? * 2 points

Mark only one oval.

- a) 1233 rpm
- b) 1273 rpm
- c) 1173 rpm
- d) 1123 rpm

36. A A 4-pole wave wound DC motor drawing an armature current of 20 A has provided with 360 armature conductors. If the flux per pole is 0.015 Wb then the torque developed by the armature of motor is _____ * 2 points

Mark only one oval.

- a) 10.23 N-m
- b) 34.37 N-m
- c) 17.17 N-m
- d) 19.08 N-m

37. Practical reason behind speed of DC shunt motor is proportional to back emf only is _____ * 2 points

Mark only one oval.

- a) Back emf is equal to armature drop
- b) Flux is proportional to field current
- c) Flux is proportional to armature current
- d) Flux is practically constant in DC shunt motors

38. A DC generator without commutator is a * 2 points

Mark only one oval.

- a) AC generator
- b) DC motor
- c) DC generator
- d) induction motor

39. In a dc machine 72 number of coils are used. Find the number of commutator segments required? * 2 points

Mark only one oval.

- a) 36
- b) 720
- c) 72
- d) 74

40. In a dc machine 4 pole lap winding is used. The number of parallel paths are? * 2 points

Mark only one oval.

- a) 2
- b) 4
- c) 1
- d) 8

41. In a lap winding dc machine number of conductors are 100 and number of parallel paths are 10. Find the average pitch * 2 points

Mark only one oval.

- a) 10
- b) 100
- c) 50
- d) 1000

42. A shunt generator is running at 1000 rpm. If flux is reduced by half, then what is the new speed? * 2 points

Mark only one oval.

- a) 1000 rpm
- b) 2000 rpm
- 500 rpm
- 0 rpm
- Other: _____

43. A DC 4 pole lap wound generator is running at 1000 rpm having 1200 conductors and flux density is 10 mwb. find the generated emf? * 2 points

Mark only one oval.

- a) 20V
- b) 10V
- c) 200V
- d) 100V

44. Field weakening control method is used for the _____ ? * 2 points

Mark only one oval.

- a) above rated speed
- b) below rated speed
- c) both A and B
- d) none of the above

45. A Transformer has 200 W as iron loss at full load. The iron loss at half load will be * 2 points

Mark only one oval.

- a) 100 W
- b) 50 W
- c) 200 W
- d) 400 W

46. A 230 / 2300V Transformer take a no load current of 5 A at 0.25 power factor lagging. The core loss is * 2 points

Mark only one oval.

- a) 300.5 W
- b) 192.5 W
- 287.5 W
- 212.5 W

47. A Transformer has full load copper loss of 400 W. The copper loss at half load is * 2 points

Mark only one oval.

- 200 W
- 400 W
- 100 W
- 800 W

48. At what condition does an ideal transformer gives maximum efficiency? * 2 points

Mark only one oval.

- a) Copper loss = 0
- b) Copper loss = infinity
- c) Copper loss = iron loss
- d) Copper loss = 99%

49. In Single Phase Transformer, The Primary Current and Primary Voltage is 4.55 and 11kV respectively. The Rating of the transformer would be_____? * 2 points

Mark only one oval.

- a) 50kVA
- b) 86kVA
- c) 100kVA
- d) 150kVA

Saranathan College of Engineering

Tiruchirapalli

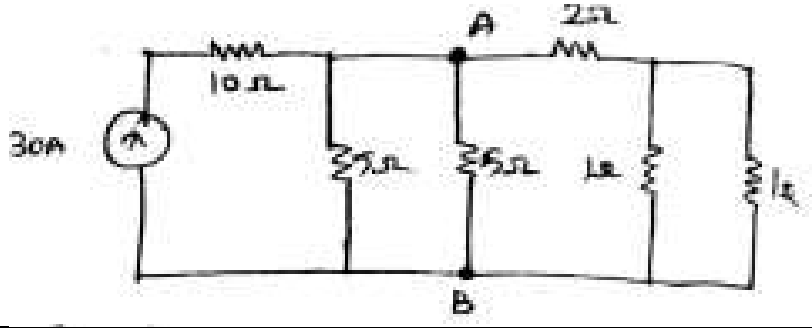
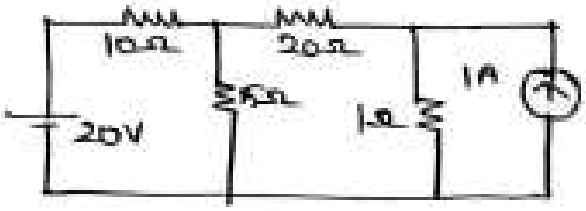
Internal Assessment Test - II			Date	02.06.2021	Marks	50
Course code	BE8253	Course Title	Basic Electrical, Electronics & Instrumentation Engineering			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	I	Semester	II	Department	Mechanical	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	State Norton's theorem.	C112.1	R
2	State Superposition theorem.	C112.1	R
3	State Maximum Power Transfer theorem.	C112.1	R
4	What do you mean by RMS value?	C112.2	U
5	Define form factor.	C112.2	R
6	What is phase sequence?	C112.2	U
7	A coil has R=10Ω and X_L=20mH. Calculate its power factor.	C112.2	A
8	How the line and phase values (currents & voltages) in star connected line?	C112.2	R
9	Mention the various accessories used in wiring.	C112.2	R
10	What are the types of electrical wiring?	C112.2	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	A coil having R=20Ω and L=0.05H is connected across a 250V 50 cycle source. Calculate inductive reactance, impedance, phase angle, power factor, current, voltage across resistance, inductance and coil, real power, reactive power and apparent power. Also draw the phasor diagram indicating the values of current, voltages and phase angle.	C112.2	A & E
	(OR)		
12	For an RLC series circuit which is supplied with an ac source derive the expression for inductive reactance, capacitive reactance, impedance, phase angle, power factor, current, voltage across resistance, inductance and capacitance, real power, reactive power and apparent power. Also draw the phasor diagram indicating the values of current, voltages and phase angle.	C112.2	AZ & E
13	For a delta connected three phase circuit, determine the relations between the line and phase values of current and voltages by drawing a suitable circuit and phasor diagram. Also write the expressions for various powers in terms of both line and phase values.	C112.2	AZ & E
	(OR)		
14	Explain about the staircase wiring with neat sketch. Mention its purpose. Also tabulate the truth table for both direct connection and cross connection of switches.	C112.2	R

PART – C (Answer all the questions 1 x 10 = 10marks)			
Q. No.	**Questions**	**CO**	**Skills**
15	Find the current through the terminal AB in the below circuit using Norton's theorem. 	C112.1	AZ & E
(OR)			
16	Find the current through 5Ω resistor using superposition theorem in the below circuit. 	C112.1	AZ & E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date	30.06.2021	Marks	50
Course code	BE8253	Course Title	Basic Electrical, Electronics & Instrumentation Engineering			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	I	Semester	II	Department	Mechanical	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What is the purpose of commutator in DC generator?	C112.3	U
2.	Define slip in an induction motor.	C112.3	R
3.	Why single-phase induction motors are not self-starting?	C112.3	U
4.	What is the value of resistance and reactance of the secondary of transformer when it is referred to primary side?	C112.3	U
5.	Differentiate between avalanche and Zener breakdown.	C112.4	U
6.	Mention the applications of Zener diode.	C112.4	R
7.	Draw the circuit diagram of CE configuration of transistor to obtain its characteristics.	C112.4	R
8.	Define pinch-off voltage in JFET.	C112.4	R
9.	Mention the criteria required to choose a transducer.	C112.5	R
10.	What do you mean by piezoelectric effect?	C112.5	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Explain all characteristics of various types DC motor with neat sketch.	C112.3	U
	(OR)		
12.	Explain about split phase induction motor and shaded pole induction motor with neat sketch.	C112.3	U
13.	Explain about the construction and operation of N-channel JFET.	C112.4	U
	(OR)		
14.	Explain about any two types of digital to analog converter.	C112.4	U

PART – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15.	Explain about the construction and operation of LVDT in detail.	C112.5	U
	(OR)		
16.	Explain about the construction and operation of PMMC instruments.	C112.5	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

IA TEST 1 IA TEST 1 EE-8002 DESIGN OF ELECTRICAL APPARATUS

Time 10 AM to 11 AM
You can view the answer after 11 AM

The respondent's email (**null**) was recorded on submission of this form.
* Required

1. Email *

2. Name of the Student *

3. Batch Number *

4. 1. Major considerations to develop a design are *

Mark only one oval.

- Lower cost, Higher Efficiency, Reliability
- Lower cost, Durability, Conformity
- Lower cost, Durability, Reliability
- Lower cost, Ductility, Conformity

5. 2. Maximum temperature limit for Class F insulation is *

Mark only one oval.

- 150˚C
- 145˚C
- 155˚C
- 165˚C

6. 3.In DC machine output is limited because of _____ problem *

Mark only one oval.

- Commutation
- heating
- Higher cost
- Less efficiency

7. 4. Annealed high conductivity copper and Hard drawn copper wires are used for winding of electrical machines *

Mark only one oval.

- True
- False

8. 5. Materials exhibiting zero value of resistivity are known as *

Mark only one oval.

- good conductors
- good Insulators
- Super conductors
- Super insulators

9. 6. If Relative permeability is μr >> 1 , then the material comes under *

Mark only one oval.

- Diamagnetic materials
- Paramagnetic materials
- Permanent magnet materials
- Ferromagnetic materials

10. 7. Carter's coefficient is applicable for estimating *

Mark only one oval.

- requirement of air gap mmf
- flux distribution in airgap
- length of air gap
- no-load loss

11. 8. Which property of copper enabled it to be drawn into thin wires and sheets? *

Mark only one oval.

- Ductility
- Elasticity
- Tenacity
- Toughness

12. 9. good thermal conductivity is not one of the important property of Insulating material *

Mark only one oval.

- True
- False

13. 10. Which of the following material has the highest permeability *

Mark only one oval.

- Cobalt
- Nickel
- Permalloy
- Silicon stel

14. 11. gap contraction factor is defined as the ratio of *

Mark only one oval.

- reluctance of air gap of smooth armature to reluctance of air gap of slotted armature
- reluctance of air gap of slotted armature to reluctance of air gap of smooth armature
- reluctance of stator magnetic circuit to rotor magnetic circuit
- reluctance of field magnetic circuit to armature magnetic circuit

15. 12. The ratio of Ws/lg is called *

Mark only one oval.

- Field form factor
- carter's coefficient
- Total gap contraction factor
- Space factor

16. 13. The gap expansion factor is always greater than one *

Mark only one oval.

- True
- False

17. 14. The peripheral distance between the two centers of adjacent pole is called *

Mark only one oval.

- slot pitch
- pole pitch
- commutator pitch
- Armature pitch

18. 15. The class of insulation used for large rating turbo machine is *

Mark only one oval.

- A
- B
- C
- E

19. 16. The stacking factor is always greater than one *

Mark only one oval.

- True
- False

20. 17. In a DC machine if the number of slots in the armature are large *

Mark only one oval.

- cooling is likely to be poor
- commutation will be poor
- cost will increase
- the flux pulsation will increase

21. 18. In a DC machine the width of carbon brush should be equal to *

Mark only one oval.

- less than the width of one commutator segment
- the width of 1 to 2 commutator segment
- the width of 2 to 3 commutator segment
- the width of more than 3 commutator segment

22. 19. In a DC machine the number of pole is generally decided by *

Mark only one oval.

- Frequency flux reversals
- weight of iron parts
- weight of copper
- all the above

23. 20. What is maximum peripheral speed of armature *

Mark only one oval.

- 30 meter/second
- 20 meter / second
- 28 meter/second
- 1500 rpm

24. 21. The field form factor is always greater than one *

Mark only one oval.

- True
- False

25. 22. The flux density which is calculated over one pole pitch is called average flux density *

Mark only one oval.

- True
- False

26. 23. The maximum gap density is always greater than average flux density *

Mark only one oval.

- True
- False

27. 24. The output of DC machine is limited by *

Mark only one oval.

- Peripheral speed
- temperature rise
- frequency of flux reversals
- commutator diameter

28. 25. The number of armature coils are equal to number commutator segments *

Mark only one oval.

- True
- False

29. 26. What are called main dimensions? *

Mark only one oval.

- Diameter and Length of stator bore
- Diameter and Length of commutator
- Diameter and Length of yoke
- Diameter and Length of shaft of the machine

30. 27. The unit of carbon brush pressure is *

Mark only one oval.

- newton meter
- KN/m^2
- KN/m
- K^2N/M

31. 28. Lap winding is preferred for *

Mark only one oval.

- Low voltage and high current applications
- highvoltage and high current applications
- Low voltage and Low current applications
- High voltage and low current applications

32. 29. The material for dc machine brushes is generally *

Mark only one oval.

- aluminium
- copper
- electro-graphite
- brass

33. 30. Inter poles in dc machines are provided to reduce *

Mark only one oval.

- hunting
- iron loss
- temperature rise
- sparking

PART- B (15 x 2 = 30 marks)

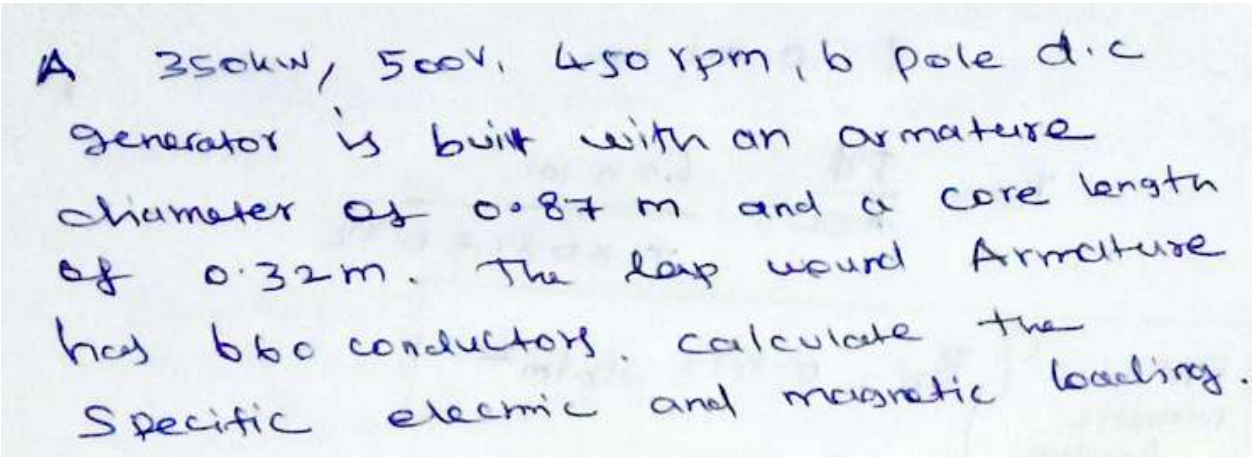
Answer ALL questions (Note : Type the answer(don't mention the unit) for each question and upload the separate answer sheet in google class room)

34. 31. *

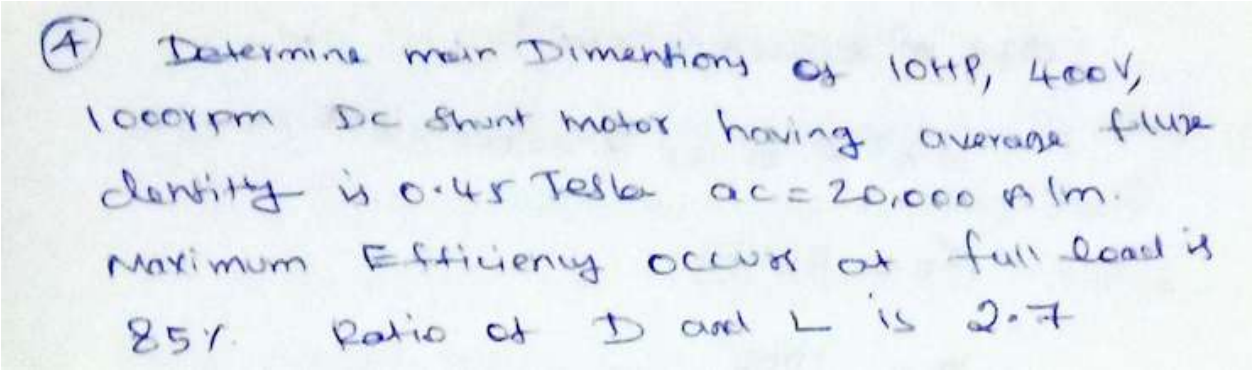
3. Estimate the effective gap area per pole of a 10 pole, slip ring induction motor with following data:

stator bore = 0.65m, core length = 0.25m, No. of stator slots = 90
stator slot opening = 3mm, rotor slots = 120
rotor slot opening = 3mm, air gap length = 0.95mm
Carter's coefficient for ducts = 0.68, Carter's coefficient for slots = 0.46
number of ventilating ducts = 3 each on rotor and staor
width of ventilating ducts = 10mm.

35. 32. *



36. 33. *



EE8403 Measurements & Instrumentation

IA Test 1

The respondent's email (**null**) was recorded on submission of this form.

1. Email *

2. Name

3. Batch No.

4. Year/Sem/Sec

Part A

30 * 1 Mark = 30 Marks

5. The use of instruments is merely confined within laboratories as standardizing instruments. 1 point

Mark only one oval.

- absolute
- indicating
- recording
- integrating
- none of the above

6. Which of the following instruments indicate the instantaneous value of the electrical quantity being measured at the time at which it is being measured ? 1 point

Mark only one oval.

- Absolute instruments
- Indicating instruments
- Recording instruments
- Integrating instruments

7. Which instruments are those that measure the total quantity of electricity delivered in a particular time. 1 point

Mark only one oval.

- Absolute
- Indicating
- Recording
- Integrating

8. Which of the following are integrating instruments ? 1 point

Mark only one oval.

- Ammeters
- Voltmeters
- Wattmeters
- Ampere-hour and watt-hour meters

9. A moving-coil permanent-magnet instrument can be used as _____by using a low resistance shunt. 1 point

Mark only one oval.

- ammeter
- voltmeter
- flux-meter
- ballistic galvanometer

10. A moving-coil permanent-magnet instrument can be used as flux-meter 1 point

Mark only one oval.

- by using a low resistance shunt
- by using a high series resistance
- by eliminating the control springs
- by making control springs of large moment of inertia

11. Which of the following devices may be used for extending the range of instruments ? 1 point

Mark only one oval.

- Shunts
- Multipliers
- Current transformers
- Potential transformers
- All of the above

12. An induction meter can handle current upto 1 point

Mark only one oval.

- 10 A
- 30 A
- 60 A
- 100 A

13. Driving system in an induction type single phase energy meter consists of _____ 1 point

Mark only one oval.

- one magnet
- two electromagnets
- five electromagnets
- ten magnets

14. Moving system of the induction type single phase energy meter has _____ 1 point

Mark only one oval.

- heavy aluminium disc
- light aluminium disc
- medium aluminium disc
- no aluminium disc

15. The household energy meter is 1 point

Mark only one oval.

- an indicating instrument
- a recording instrument
- an integrating instrument
- none of the above

16. In majority of instruments damping is provided by 1 point

Mark only one oval.

- fluid friction
- spring
- eddy currents
- all of the above

17. An ammeter is a 1 point

Mark only one oval.

- secondary instrument
- absolute instrument
- recording instrument
- integrating instrument

18. In a portable instrument, the controlling torque is provided by 1 point

Mark only one oval.

- spring
- gravity
- eddy currents
- all of the above

19. A ..... device prevents the oscillation of the moving system and enables the latter to reach its final position quickly 1 point

Mark only one oval.

- Deflecting
- Controlling
- Damping
- Any of the above

20. Which error is also termed as measurement error? 1 point

Mark only one oval.

- Static errors
- Dynamic errors
- Systematic errors
- Statical error

21. In retardation type measuring lag the instrument responds after an unspecified dead time lag. 1 point

Mark only one oval.

- True
- False

22. Measuring lag is a dynamic characteristic. 1 point

Mark only one oval.

- False
- True

23. The ratio of maximum displacement deviation to full scale deviation of the instrument is called 1 point

Mark only one oval.

- static sensitivity
- dynamic deviation
- linearity
- precision or accuracy

24. Systematic errors are 1 point

Mark only one oval.

- instrumental errors
- environmental errors
- observational errors
- all of the above

25. If an instrument has cramped scale for larger values, then it follows 1 point

Mark only one oval.

- square law
- logarithmic law
- uniform law
- none of the above

26. Wattmeter cannot be designed on the principle of 1 point

Mark only one oval.

- electrostatic instrument
- thermocouple instrument
- moving iron instrument
- electrodynamic instrument

27. In an energy meter braking torque is produced to 1 point

Mark only one oval.

- safe guard it against creep
- brake the instrument
- bring energy meter to stand still
- maintain steady speed and equal to driving torque

28. The disc of an instrument using eddy current damping should be of 1 point

Mark only one oval.

- conducting and magnetic material
- non-conducting and magnetic material
- conducting and non-magnetic material
- none of the above

29. The function of shunt in an ammeter is to 1 point

Mark only one oval.

- by pass the current
- increase the sensitivity of the ammeter
- increase the resistance of ammeter
- none of the above

30. A moving iron instrument can be used for 1 point

Mark only one oval.

- D.C. only
- A.C. only
- both D.C. and A.C.

31. The resistance in the circuit of the moving coil of a dynamometer wattmeter should be 1 point

Mark only one oval.

- almost zero
- low
- high
- none of the above

32. What is the effect of eddy currents in the aluminium disc? 1 point

Mark only one oval.

- varies by a factor of twice the disc length
- independent of the disc speed
- varies by a factor of four times the disc size
- proportional to the disc speed

33. Energy meter creeps _____ 1 point

Mark only one oval.

- due to change in supply
- due to reversal in polarity of voltage
- due to asymmetry in magnetic circuit
- due to turns ratio of transformer

34. Creeping is avoided by _____ 1 point

Mark only one oval.

- reversing the polarity of the voltage
- drilling two diametrically opposite holes
- holding the disc
- increasing the friction

Part B

15 * 2 Marks = 30 Marks (Multiple options can be correct)

35. The gravity controlled instrument has crowded scale because current is proportional to 2 points

Mark only one oval.

- balancing weight
- deflection angle
- sine of deflection angle

36. What is the International System of length used to measure displacement? 2 points

Mark only one oval.

- Metre
- Kilo Meter
- Centimetre
- Yards

37. What is the mean value of a distance observation set taken by a distance measurement sensor?Observations = {2,2.13,2.1,1.9} 2 points

Mark only one oval.

- 2.0325
- 2.2
- 2
- 2.1325

38. What is the relative accuracy ratio of an observation taken by a IR(Infrared) sensor which predicts the distance of an object to be 1.26 cm but the actual distance is 1cm? 2 points

Mark only one oval.

- 13:409
- 13:50
- 13:619
- 50:619

39. What is the relative error percentage of an observation taken by an infrared sensor which predicts the distance of an object to be 3.32cm but the actual value is 3.1cm? 2 points

Mark only one oval.

- 12%
- 7.09%
- 6%
- 5%

40. The desirable static characteristics of a measuring system are 2 points

Tick all that apply.

- [ ] Accuracy
- [ ] Sensitivity
- [ ] Reproducability
- [ ] Drift
- [ ] Fidelity

41. Aluminium is selected as the material for rotating disc of energy meter because 2 points

Tick all that apply.

- [ ] It is good conductor
- [ ] It is light
- [ ] It is indigenously available
- [ ] Both a & b
- [ ] Both c & b
- [ ] none of the above

42. Various adjustments in an energy meter include 2 points

Tick all that apply.

- [ ] light load or friction
- [ ] lag and creep
- [ ] overload and voltage compensation
- [ ] temperature compensation
- [ ] none of the above
- [ ] Option a & b
- [ ] Option b & D

43. The power of a n-phase circuit can be measured by using a minimum of 2 points

Mark only one oval.

- (n - 1) wattmeter elements
- n wattmeter elements
- (n + 1) wattmeter elements
- 2n wattmeter elements

44. Which is the emf(electromotive force) induced in a coil of electrodynamometer type voltmeter if it has 8 turns and rate of change of flux with respect to time is 0.5? 2 points

Mark only one oval.

- -10 V
- -8V
- -4V
- -2V

45. An instrument transformer is used to extend the range of 2 points

Mark only one oval.

- Induction instrument
- Electrostatic instrument
- Moving coil instrument
- Any of the above

46. Induction type single phase energy meters measure electric energy in 2 points

Mark only one oval.

- kW
- Wh
- kWh
- VAR

47. In a 3-phase power measurement by two wattmeter method, both the watt meters had identical readings. The power factor of the load was 2 points

Mark only one oval.

- Unity
- 0.8 lagging
- 0.8 leading
- Zero

48. A power factor meter has 2 points

Mark only one oval.

- One current circuit and two pressure circuits
- One current circuit and one pressure circuit
- Two current circuits and one pressure circuit
- None of the above

49. A dynamometer wattmeter can be used for 2 points

Mark only one oval.

- Both D.C. and A.C.
- D.C. only
- A.C. only
- Any of the above

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III			Date/ Session	18.05.21/ FN	Marks	50
Course code	EE8403	**Course Title**	**Measurements and Instrumentation**			
Batch No.		**Duration**	90 mins	**Academic Year**	2020-2021	
Year	II	**Semester/ Section**	IV / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the basic components of tape recorder?	C212.4	R
2	Draw a neat diagram of XY Recorder	C212.4	R&A
3	Discuss the advantages & disadvantages of PDM Recording	C212.4	R
4	What is the principle of operation of inkjet printer?	C212.4	R
5	Differentiate between LED and LCD	C212.4	U
6	What is an inverse transducer with an example?	C212.5	R
7	Give the factors to be considered in selecting transducer.	C212.5	U&A
8	Define piezoelectric effect	C212.5	U
9	What is thermistor? Mention some application.	C212.5	R
10	What is smart sensor? Mention some applications of it.	C212.5	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	With a neat diagram explain the basic components and working principle of tape recorder	C212.4	U&AZ
	OR		
12	With a neat diagram explain the basic components and working principle of CRO and discuss its advantages & disadvantages over Digital CRO.	C212.4	U
13	Explain how using a differential arrangement, a capacitive transducer which works on the principle of variation of capacitance with displacement between two plates, the response can be made linear.	C212.5	U
	OR		
14	Explain the construction and principle of working of a LVDT. Explain how the magnitude and direction of displacement of core of an LVDT detected.	C212.5	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	What are the essential functional operations of a digital data acquisition system?	C212.6	AZ
	OR		
16	1. How are the strain gauge used for pressure measurement? 2. Explain in detail about smart sensor.	C212.6	AZ & U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date	05.05.2021	Marks	50
Course code	BE8353	Course Title	Basic Electrical, Electronics & Instrumentation Engineering			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	I	Semester	II	Department	Mechanical	

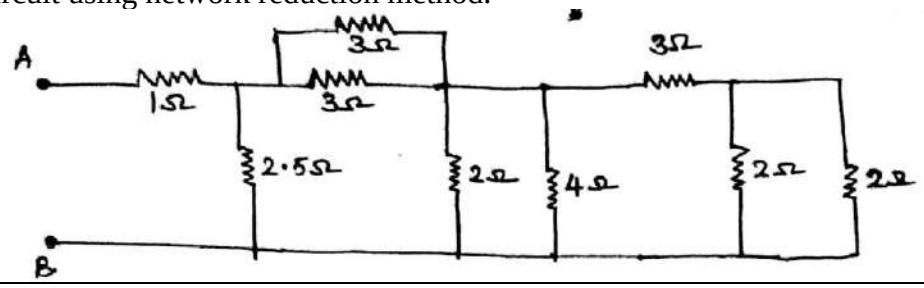
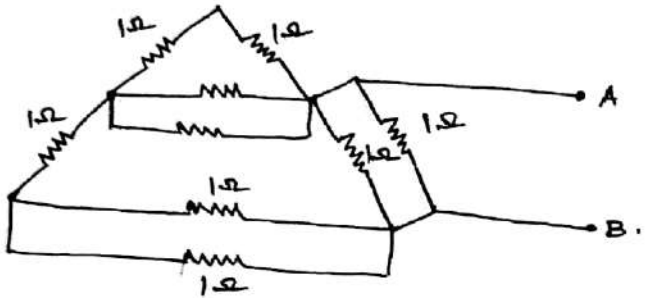
Part – A

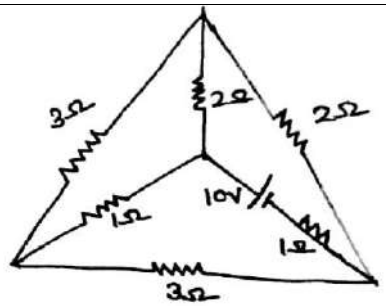
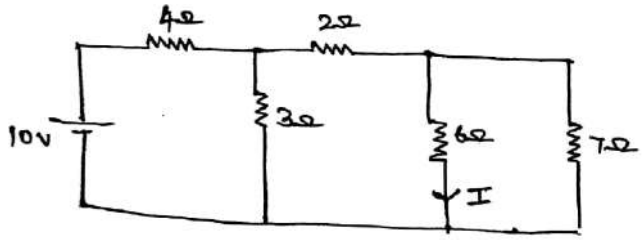
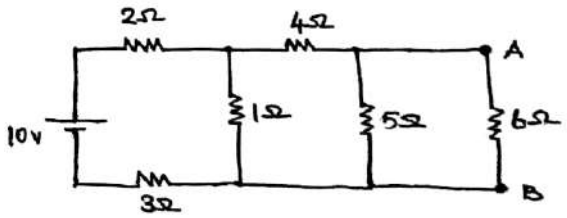
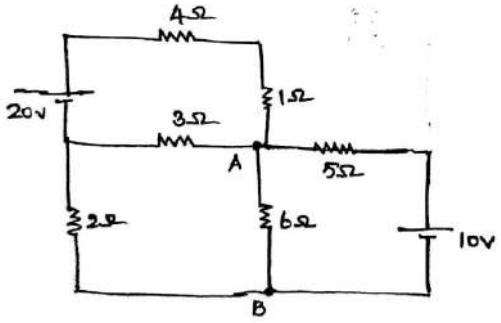
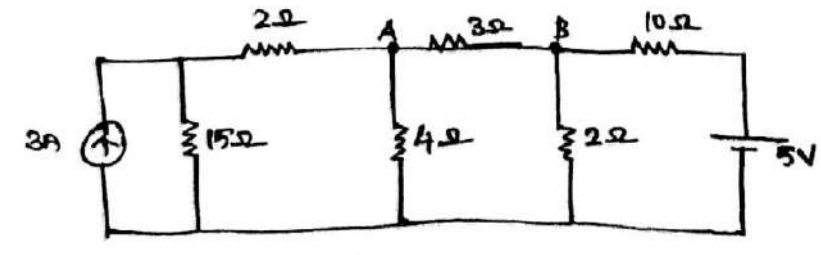
(Answer all the questions 5 x 2 = 10marks)

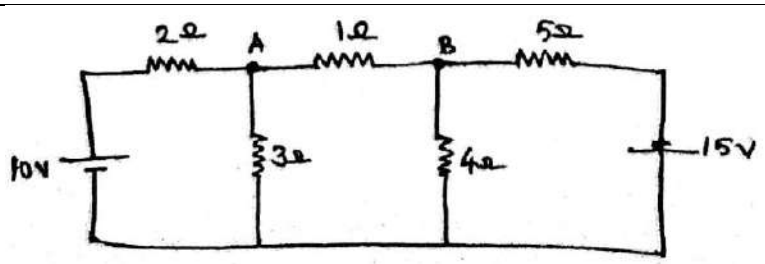
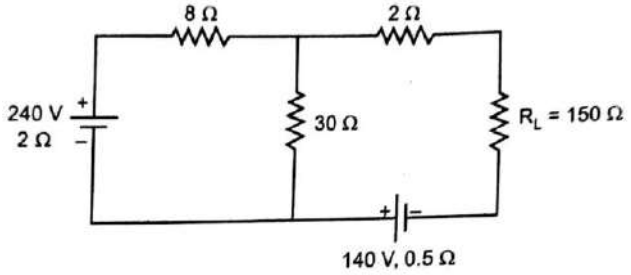
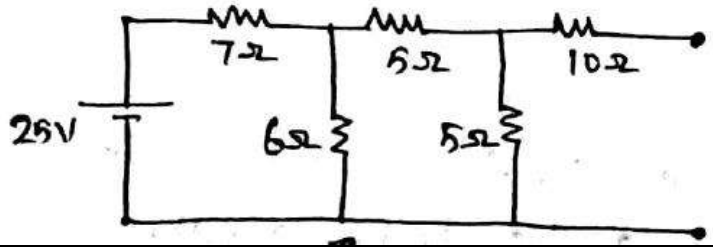
Q. No.	Questions	CO	Skills
1	What is the effective capacitance value when two capacitors of 2 micro Farad each are connected in series?	C112.1	E
2	Mention the limitations of Ohm's law.	C112.1	U
3	A voltage source of 10V has an internal resistance of 2Ω are connected in series. Draw its equivalent current source model.	C112.1	E
4	A resistance of 50Ω is connected in series with a unknown resistor. The potential drop across the 30Ω resistor and unknown resistor is 150V and 50V respectively. Find the value of unknown resistor.	C112.1	E
5	Two resistors connected in parallel across 220V supply take 10A from the mains. If the power dissipated in one of the resistor is 1000W, find the value of other resistor.	C112.1	E

Part – B

(Answer all the questions 5 x 8 = 40marks)

Q. No.	Questions	CO	Skills
6	Find the effective resistance between the terminals A&B in the following circuit using network reduction method. 	C112.1	AZ & E
	(OR)		
7	Find the effective resistance between the terminals A&B in the following circuit using network reduction method. 	C112.1	AZ & E
8	Using Kirchoff laws determine the current supplied by the source in the following circuit.	C112.1	AZ & E

			
	(OR)		
9	Determine the current I in the following circuit using Kirchoff laws. 	C112.1	AZ & E
10	Using mesh analysis find the current in the branch AB in the following circuit. 	C112.1	AZ & E
	(OR)		
11	Using mesh analysis find the current in the branch AB in the following circuit. 	C112.1	AZ & E
12	Using Nodal analysis find the current in the branch AB in the following circuit. 	C112.1	AZ & E
	(OR)		
13	Using Nodal analysis find the current in the branch AB in the following circuit.	C112.1	AZ & E

			
14	Find the current in the 150Ω resistor using Thevenin's theorem. 	C112.1	AZ & E
	(OR)		
15	Draw the Thevenin's equivalent circuit for the following circuit. 	C112.1	AZ & E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the staff Member: R.Sridhar/AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	19.05.2021/ FN	Marks	50
Course code	EI8451	**Course Title**	Electrical Machines			
Batch No.		**Duration**	90 mins	**Academic Year**	2020-2021	
Year	II	**Semester/ Section**	IV/A	**Department**	ICE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	How to reverse the direction of rotation in three phase Induction motor?	C210.4	U
2	Write the values of slip at the time of starting and at maximum torque.	C210.4	U
3	The power input to the rotor of a 415V, 4 pole, 3 phase induction motor is 55kW. The frequency of the rotor EMF is 2Hz.Find the rotor copper loss and mechanical power developed.	C210.4	A
4	Can an induction motor run at zero slip? State the reason.	C210.4	U
5	Is it possible to change the direction of rotation of a shaded pole motor? Justify your answer.	C210.4	U
6	A 6 pole, 500hp, 415V, 3φ, 50Hz induction motor runs at 950rpm. Calculate its full load slip.	C210.4	A
7	Why an Induction motor is called as a 'rotating transformer'?	C210.5	U
8	Write the methods used to make the 1φ induction motor self-starting.	C210.5	U
9	Why the BLDC motor is also called as trapezoidal PMAC motor?	C210.5	U
10	How universal motor is different from DC motor?	C210.5	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(i) A 400V, 50Hz, 4-pole, star connected induction motor takes a line current of 10 A with 0.86 p.f. lagging. Its total stator losses are 5% of the input. Rotor copper losses are 4% of the input to the rotor and mechanical losses are 3% of the input of the rotor. Calculate (i) Slip and rotor speed (ii) Torque developed in the rotor (iii) Shaft torque. (6) (ii) A 3-phase SCIM takes a starting current 6 times the full load current. Find the starting torque as a percentage of full-load torque if the motor uses (i) DOL (ii) Star-Delta Starter. Assume a full load slip of 4%. (4)	C210.4	A
	or		
12	A 4 pole, 400V, 3φ, 50Hz induction motor has star connected stator and rotor. Rotor resistance and reactance are 0.2Ω per phase and 0.1Ω per phase respectively at standstill. The ratio of stator and rotor turns is 1.2. Calculate the torque and power at full load for a slip of 4%. Find the maximum torque and speed at which it occurs.	C210.4	A
13	Why the single phase induction motor is not self-starting? Discuss the double field revolving theory of 1φ induction motor along with the Torure-slip characteristics.	C210.5	A
	or		
14	(i) A 200W, 230V, 50Hz single phase Capacitor start Induction Motor has winding parameters of Z_M = 4.5Ω+3.7Ω and Z_A = 9.5Ω+3.5Ω. Find the value of capacitance that will be added in the auxiliary winding to produce maximum starting torque. (6) (ii) Calculate the stepping angle for (i) a 3-phase, 16-tooth rotor VR Motor (ii) a 3-phase, 24-tooth rotor PM Motor (4)	C210.5	A
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	A 400 V, 50 Hz, 6 pole, delta connected, three phase induction motor consumes 45 kW, with a line Current of 75A and runs at slip of If the stator	C210.4	AZ

	iron loss is 1200 W, windage and friction loss are 900 W and resistance between two Stator terminals is 0.12Ω, Calculate i) power supplied to rotor ii) Rotor Copper loss iii) Shaft Torque iv) Shaft Power v) Efficiency		
	or		
16	A 440 V, 3 phase, 8 pole, 50 Hz, star connected induction motor has the following parameters: Stator resistance = 0.1Ω, Stator reactance = 0.4Ω. Equivalent rotor resistance referred to stator = 0.15Ω, equivalent rotor reactance referred to stator = 0.44Ω. The stator core loss is 1250 W while mechanical loss is 1000W. It draws a no load current of 20 A at a p.f. of 0.09 lagging. While running at a speed of 727.5 rpm, Calculate: 1)Input line current and p.f.; 2)Torque developed; 3)Output power; 4)Efficiency. Draw approximate equivalent circuit.	C210.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.P.Ram Prakash, AP/EEE

Saranathan College of Engineering

Internal Assessment Test – I			Date/ Session	05.05.2021	Marks	50
Course code	BE 8255	Course Title	Basic Electrical,Electronics and Measurement Engineering			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	I	Semester/ Section	II / A	Department	CSE	

Part – A
(Answer all the questions 5 x 2 = 10 marks)

Q. No.	Questions	CO	Skills
1	What is the function of Commutator in DC generator?	110.3	U
2	Distinguish between Brushed DC motor and Brushless DC motor.	110.3	U
3	Define synchronous speed in AC machine.	110.3	U
4	What are the properties of ideal transformer?	110.3	R
5	Define step angle in stepper motor.	110.3	U

Part – B
(Answer all the questions 5 x 8 = 40 marks)

Q. No.	Questions	CO	Skills
6	Explain with the help of a sketch, the constructional features of a dc machine and briefly describe the functions of armature core, field system and brushes.	110.3	R,U
	OR		
7	A six-pole, lap-connected generator is driven at 600rpm. It has 100 slots with 24 conductors per slot. What is the magnitude of the generated emf? If the number of conductors per slot is changed to 20.At what speed should the generator be run for the same voltage to be generated? The flux per pole is 0.02Wb.	110.3	AZ,E
8	Arrive at an expression for emf equation of the transformer and discuss about transformation ratio.	110.3	R,U
	OR		
9	The emf per turn of a single phase 10 kVA, 2200/220V, 50 Hz transformer is 10V. Calculate (i) the number of primary and secondary turns, (ii) the net cross-sectional area of core for a maximum flux density of 1.5T.	110.3	R,U
10	With neat diagram, explain the working principle of Permanent magnet stepper motor and mention its applications.	110.3	R,U
	OR		
11	With neat diagram, explain the working principle of DC motor	110.3	R,U
12	Explain with sketches, the constructional features of a synchronous machine.	110.3	R,U
	OR		
13	Explain with sketches the constructional features of a three phase induction motor.	110.3	R,U
14	With neat diagram, explain the working principle of Brushless DC motor and mention its applications	110.3	R,U
	OR		
15	Derive an expression for the torque developed by DC motor and three-phase induction motor.	110.3	R,U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).
Skill need to be mentioned against each question

Name of the Faculty: Dr.S.Vijayalakshmi/EEE, Mrs.C.Pealine kamalini/EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	02/06/2021	Marks	50
Course code	BE8255	Course Title	BASIC ELECTRICAL, ELECTRONICS & MEASUREMENT ENGINEERING			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	I	Semester/ Section	II / A&B	Department	CSE & IT	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the advantages & disadvantages of Renewable energy sources?	C110.3	U
2	What are the applications of Solar energy?	C110.3	U
3	Define Tariff	C110.3	R
4	Define COP	C110.3	R
5	Define primary & secondary cell	C110.3	R
6	What are the advantages of Earthing?	C110.3	U
7	Define semiconductor and its types.	C110.4	U
8	Compare CB, CE, and CC	C110.4	U
9	Define PN junction diode i. cut in voltage ii. Break down voltage	C110.4	R
10	What is Zener diode? Mention some applications of Zener diode.	C110.4	A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q.No.	Questions	CO	Skills
11	Explain in detail about Solar power generation system. Also define the advantages, Disadvantages and application of the same.	C110.3	U
	or		
12	Explain in detail about construction and operation of window air conditioning system with its electrical circuit diagram	C110.3	U
13	Briefly explain about lead acid battery.	C110.3	A
	or		
14	Briefly explain about circuit breakers	C110.3	R

Part – C (1 x 10 = 10marks)

15	Explain the characteristics of PN junction diode under forward and reverse biased condition.	C110.4	AZ
	Or		
16	Draw the circuit and explain the input and output characteristics of Common Emitter configuration.	C110.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name: Dr.S.Vijayalakshmi (CSE-A-sec), Mrs.C. Pearlin kamalini (CSE-B-sec) & P.Rameshbabu(IT)

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	30-04-2021	Marks	50
Course code	IC8451	Course Title	CONTROL SYSTEMS			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	II	Semester	IV	Department	EEE	

Part – A

(Answer all the questions 5 x 2 = 10marks)

Q. No.	Questions	CO	Skills
1	Determine type number and order of the following system $\mathbf{G(S)H(S) = \frac{10}{S^3(S^2+2S+1)}}$	C214.2	A
2	Draw the block diagram of PD controller when proportional gain is 10 and derivative time is 20sec.	C214.2	U
3	Draw the polar plot for the below transfer function. $\mathbf{G(S)H(S) = \frac{1}{S^2(S^3+S^2+4S+2)}}$	C214.3	A
4	Determine phase margin for a system having the below transfer function and gain cross over frequency is 1.1 rad/sec. $\mathbf{G(S)H(S) = \frac{20}{S(1+3S)(1+4S)}}$	C214.3	A
5	Draw the pole zero plot of the lag-lead compensator.	C214.3	U

Part – B

(Answer all the questions 5 x 8 = 40marks)

Q. No.	Questions	CO	Skills
6	Derive the expressions for second order system when the input is unit step for underdamped case and sketch the response.	C214.2	AZ
	(OR)		
7	A positional control system with velocity feedback has $\boldsymbol{G(s) = \frac{25}{S(S+2)}}$ & **H(S) = KS +1.** What is the response c(t) to the unit step input. Given that **ζ = 0.5.**	C214.2	E
8	The open loop transfer function of a servomechanism with unity feedback is $\boldsymbol{G(s) = \frac{10}{S(0.1S+1)}}$. The input $\boldsymbol{r(t) = 5 + 3t + \frac{7}{2}t^2}$ is applied to the system. Determine the steady state error.	C214.2	E
	(OR)		
9	The unity feedback system is characterized by an open loop transfer function is **G(s)= K / S(S+5).** Determine the gain K ,so that the system will have a damping ratio of 0.5. For this value of K, determine delay time, rise and peak time for a unit-step input.	C214.2	E
	(OR)		

10	For the system having the below transfer function determine which type of input provide constant steady state error. Also determine the value of steady state error. i) $\boldsymbol{G(s) = \frac{10}{S^2(0.1S+1)}}$ ii) $\boldsymbol{G(s) = \frac{16}{S(4S+1)}}$	C214.2	E
	(OR)		
11	Derive the transfer function of inverting type op-amp PI controller.	C214.2	AZ
12	The open loop transfer function of a unity feedback system is given by $G(s) = \frac{1}{s(1+2s)(1+3s)}$. Sketch the polar plot and determine the gain margin.	C214.3	AZ & E
	(OR)		
13	Sketch the bode plot for the following transfer function and determine the system gain K for the gain cross over frequency of 6rad/sec. $G(s) = \frac{Ks^2}{(1+0.1s)(1+0.01s)}$	C214.3	AZ & E
14	Derive the transfer function of lead compensator	C214.3	AZ
	(OR)		
15	Derive the transfer function of lag compensator	C214.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli-620012.

Internal Assessment Test - III			Date	22.05.21	Marks	50
Course code	IC8451	Course Title	Control Systems			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	II	Semester	IV	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Define Root Locus.	C213.3	U
2	What is Centroid in root locus?	C213.3	R
3	What are the effects of addition of poles to the root locus?	C213.3	R
4	State Routh's Hurwitz criterion.	C213.4	U
5	State Nyquist stability criterion.	C213.4	U
6	Define relative stability.	C213.4	R
7	What is state of a system?	C213.5	U
8	Write the state model of an LTI system.	C213.5	R
9	Draw the block diagram of state model of LTI system.	C213.5	U
10	Draw the signal flow graph of state model of LTI system.	C213.5	U

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Sketch the root locus of the system whose open loop transfer function is $G(S) = \frac{K}{S(S+2)(S+4)}$. Find the value of K so that the damping ratio of the closed loop system is 0.5.	C213.3	A
	OR		
12	Sketch the root locus of the system and determine K whose open loop transfer function is $G(S) = \frac{K(s+9)}{S(S^2+4S+11)}$.	C213.3	A
13	Use the Routh's stability criterion to determine the location of roots on the s-plane and hence the stability for the system represented by characteristic equation is $s^7 + 5s^6 + 9s^5 + 9s^4 + 4s^3 + 20s^2 + 36s + 36 = 0$	C213.4	AZ
	OR		
14	Construct the Nyquist plot for a system whose open loop transfer function is given by $G(s) = \frac{K(1+s)^2}{s^3}$. Find the range of K for stability.	C213.4	AZ

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	Determine the canonical state model of the system, whose transfer function is $G(s) = \frac{2(s+5)}{(s+2)(s+3)(s+4)}$	C213.5	AZ
	OR		
16	Given that $A_1 = \begin{bmatrix} \sigma & 0 \\ 0 & \sigma \end{bmatrix}; A_2 = \begin{bmatrix} 0 & \omega \\ -\omega & 0 \end{bmatrix}; A = \begin{bmatrix} \sigma & \omega \\ -\omega & \sigma \end{bmatrix}$. Calculate e^{At}.	C213.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/ Session	28.04.2021	Marks	50
Course code	EE8002	Course Title	Design of Electrical Apparatus			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	III	Semester/ Section	VI / A & B	Department	EEE	

Part – A

(Answer all the questions 5 x 2 = 10 marks)

Q. No.	Questions	CO	Skills
1	Calculate the pole pitch of 3Φ induction motor has core length of 0.8 m for best power factor.	313.5	U
2	What is overhang leakage flux in 3Φ induction machine?	313.5	U
3	What happens if the stator of 3Φ slip ring induction motor is short circuited and rotor is excited by 3Φ AC supply?	313.5	U
4	Distinguish between peripheral speed and run away speed in 3Φ synchronous generator	313.6	R
5	What are the limiting factors for the diameter of salient pole type synchronous machine?	313.6	U

Part – B

(Answer all the questions 5 x 8 = 40 marks)

Q. No.	Questions	CO	Skills
6	What are the main dimensions of induction motor? What are the desired values of **L / τ** , peripheral speed and width of ventilating ducts?	313.5	U
	OR		
7	Find the values of diameter and length of stator core of a 7.5kW, 220V, 50Hz, 4 poles, 3Φ induction motor for best power factor. Given specific magnetic loading = 0.4wb/m^2; specific electric loading = 22000 A/m; efficiency =0.86; and power factor = 0.87.	313.5	AZ,E
8	Explain briefly the factors to be considered while deciding the air gap length of the induction motor.	313.5	R,U
	OR		
9	Explain the factors governing the choice of average flux density in the design of three phase induction machine.	313.5	R,U
10	Determine the main dimensions, number of radial ventilating ducts, number of stator slots and number of turns per phase of a 3.7kW, 400 Volt, 3phase 4 pole, 50Hz squirrel cage induction motor to be started by a star delta starter. Workout the winding details. Assume : winding factor = 0.955, stacking factor = 0.9	313.5	AZ,E
	OR		
11	Determine the main dimensions, turns per phase, numbers of slots, conductor cross section and slot area of a 250 hp, 3 phase , 50Hz, 400 V, 1410 rpm slip ring induction motor, the slot space factor B_{av} = 0.5 wb/m^2, ac = 30000 A/m, efficiency =0.9 and power factor =0.9, core length to pole pitch is 1.2, the machine is delta connected	313.5	AZ,E

12	A 1250 kVA, 3 phase, 6600V, salient pole alternator has the following data : Airgap diameter = 1.6 m; length of core = 0.45m; number of poles = 20; armature ampere conductors meter = 30000; ratio of pole arc to pole pitch =0.65; stator slot pitch = 26 mm; current density in damper bars = $3A/mm^2$. Design a suitable damper winding for the machine.	313.6	AZ,E
	OR		
13	Determine D and L for a 100kVA, 50Hz , 3 phase, 300 rpm alternator. B_{av} = 0.55 wb/m^2, ac = 28000 A/m. Use rectangular poles and assume a suitable value for $\mathbf{L / \tau}$ in order that bolted on pole construction is used for which the maximum permissible peripheral speed is 50m/sec. The runaway speed is 1.8 times the synchronous speed.	313.6	AZ,E
14	Discuss the effects of short circuit ratio (SCR) on the performance of a synchronous machine.	313.6	U
	OR		
15	Discuss about air-gap length of synchronous machine	313.6	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty: P. RAMESH BABU/EEE

Saranathan College of Engineering

Tiruchirapalli-12

Internal Assessment Test – III			Date/ Session	20-05-2021	Marks	50
Course code	EE8002	Course Title	Design of Electrical Apparatus			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	III	Semester/ Section	VI/ B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Define SCR.	CO6	U
2	List the various methods used for the elimination of harmonics from the generated voltage of synchronous machines.	CO6	R
3	State merits of computer aided design of an electrical machine.	CO6	R
4	State the reasons for preferring circular coils in comparison to rectangular coils in transformer windings.	CO2	U
5	Top and bottom surfaces of the transformer tank are not considered for the design of cooling tubes for transformer. Why?	CO2	U
6	The voltage per turn of a 500 kVA, 11 kV/415V, Δ /Y, 3- phase transformer is 8.7 V. Calculate the number of terms per phase of LV and HV windings.	CO2	E
7	Define window space factor and state its importance.	CO5	U
8	Why stepped cores are used in transformers?	CO5	A
9	Why should we provide cooling tubes for transformers when the plain tank itself dissipates heat?	CO5	R
10	What are the factors on which no load current of a transformer depend?	CO5	U

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Determine a suitable number of slots and conductors per slot, for the stator winding of a 3 Φ,, 3300 V, 50 Hz, 300 rpm alternator. The diameter is 2.3 m and axial length of core is 0.35 m. The maximum flux density in the air gap should be approximately 0.9Wb/m^2. assume sinusoidal flux distribution. Use single layer winding and star connection for stator.	CO6	E
	OR		
12	A 500kVA, 33kV, 50Hz, 600 rpm, 3φ salient pole alternator has 180 turns per phase. Estimate the length of air gap if the average flux density is 0.54Wb/m^2, the ratio of pole arc to pole pitch is 0.65, the short circuit ratio is 1.2 ,the gap contraction factor is 1.15, and the winding factor = 0.955. The mmf required for gap is 80 percent of no load field mmf.	CO6	E

13	Derive the output equation of single phase transformer in terms of window and core area.	CO2	AZ,R
	OR		
14	A single phase, 400 V, 50 Hz , transformer is built from stampings having a relative permeability of 1000. The length of the flux path is 2.5 m, the area of cross-section of the core is 2.5 x 10^-3 m^2 and the primary winding has 800 turns. Estimate the maximum flux and no-load current of the transformer. The iron loss at the working flux density is 2.6 W/kg. Iron weighs 5.8 x10^3 kg/m^3. Stacking factor is 0.9.	CO2	E

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	A 1000 kVA , 6600/440 V, 50 Hz, 3 phase, delta/star, core type, oil immersed transformer. The design data of the transformer is : Distance between centres of adjacent limbs = 0.47m, outer diameter of high voltage winding = 0.44 m, height of frame = 1.24 m. core loss = 3.7 kW and copper loss = 10.5 kW. Design a suitable tank for the transformer. The average temperature rise of oil should not exceed 35 ˚C. Assume that convection is improved by 35% due to cooling tubes.	CO2	AZ,E
	OR		
16	Determine the dimensions of core and yoke for a 200 kVA, 50 Hz single phase core type transformer. A cruciform core is used with distance between adjacent limbs equal to 1.6 times the width of core laminations. Assume voltage per turn is 14 V, maximum flux density is 1.1 Wb/m^2, window space factor is 0.32, current density = 3 A/mm^2, and stacking factor = 0.9. The net iron area is 0.56d^2 in a cruciform core where d is the diameter of circumscribing circle. Also the width of largest stamping is 0.85d.	CO2	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

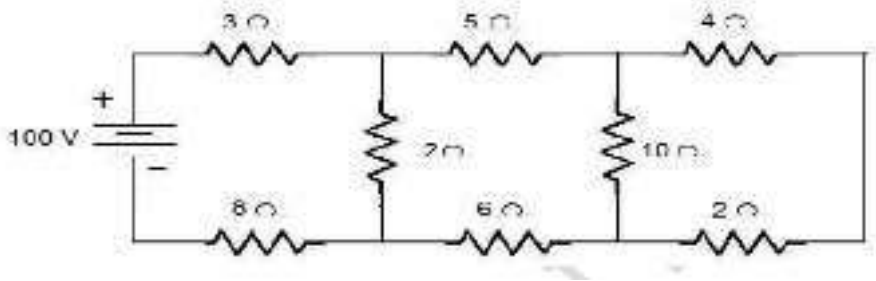
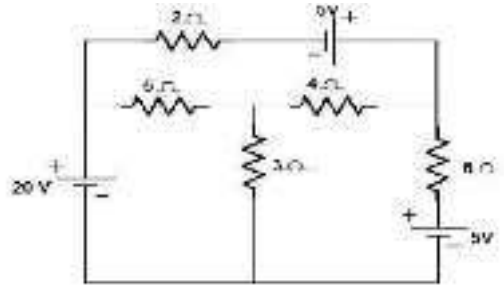
SaranathanCollegeofEngineering
Tiruchirapalli

Internal Assessment Test -I			**Date/ Session**	**5-05-2021**	**Marks**	**50**
Course code	BE 8251	**CourseTitle**	Basic Electrical and Electronics Engineering			
BatchNo.		**Duration**	90 mins	**AcademicYear**	2020-2021	
Year	I	**Semester**	II	**Department**	CIVIL	

Part – A
(Answer all the questions 5 x 2 = 10marks)

Q. No.	Questions	CO	Skills
1	Define ohms law.	C0.1	U
2	State kirchoffs current law	C0.1	U
3	Write the formula effective resistance for three resistors connected in parallel.	C0.1	U
4	State Fleming's right hand rule.	C0.2	U
5	Define mutual induction.	C0.2	U

Part – B
(Answer all the questions 5 x 8 = 40marks)

Q. No.	Questions	CO	Skills
6	Using network reduction method find the total current. 	C0.1	E
	(OR)		
7	Explain about three phase star and delta connections with neat diagrams	C0.1	U
8	Using mesh current analysis find loop currents. 	C0.1	E
	(OR)		
9	Explain about kirchoff's current law and voltage law with necessary circuits.	C0.1	U
10	Explain about construction and working of MI instruments	C0.1	U
	(OR)		

11	Explain about construction and working of PMMC instruments.	C0.1	U
12	With neat diagram explain the construction and working of single phase transformer	C0.2	U
	(OR)		
13	Derive the EMF equation of single phase transformer	C0.2	AZ & E
14	With neat diagram explain the construction and working of DC generator.	C0.2	U
	(OR)		
15	Derive the emf equation of the DC generator.	C0.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/Session	24.04.21/AN	Marks	50
Course code	EE8403	Course Title	Measurements and Instrumentation			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year/	II	Semester/Section	IV /A & B	Department	EEE	

Part – A

(Answer all the questions 5 x 2 = 10marks)

Q. No.	Questions	CO	Skills
1	What are the different types of torque produced in PMMC?	C306.2	AZ
2	What are the advantages of digital voltmeter?	C306.2	R
3	Write the necessary balance condition of Schering Bridge	C306.3	U
4	Define Transformer Ratio Bridge	C306.3	A
5	Define Interference	C306.3	R

Part – B

(Answer all the questions 5 x 8 = 40marks)

Q. No.	Questions	CO	Skills
6	Draw and Explain the moving Iron type Instrument in detail .	C306.2	R
	or		
7	Explain the instrument transformer with the neat Sketch	C306.2	AZ
8	Obtain the BH curve of the ring specimen using Reversal method	C306.2	R
	or		
9	Explain the construction and operating Principle of Digital Voltmeter	C306.2	U
10	Explain the Maxwell's bridge in detail with the circuit diagram	C306.3	R
	or		
11	Discuss the effects of Electrostatic and Electromagnetic Interference in Instruments	C306.3	AZ
13	Explain the Schering bridge in detail with the circuit diagram	C306.3	R
	or		
14	Explain about the DC potentiometer with diagram	C306.3	U
15	Detailed Notes on Earthing	C306.3	AZ
16	Explain the Types of AC potentiometer	C306.3	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/ Session	26.04.2021	Marks	50
Course code	EE8602	Course Title	Protection and Switchgear			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	III	Semester/ Section	VI / A & B	Department	EEE	

Part – A

(Answer all the questions 5 x 2 = 10 marks)

Q. No.	Questions	CO	Skills
1	What are the various faults that would affect an alternator?	311.3	U
2	What is over fluxing protection in transformer?	311.3	U
3	What are the factors on which the arc resistance depend?	311.5	U
4	What are the methods of arc interruption?	311.5	R
5	What is meant by rupturing capacity of a circuit breaker?	311.6	U

Part – B

(Answer all the questions 5 x 8 = 40 marks)

Q. No.	Questions	CO	Skills
6	Describe the Merz price circulating current system of protection used for power transformer with neat diagrams.	311.3	R
	OR		
7	Describe the types of protective schemes employed for the protection of field winding and loss excitation of alternator.	311.3	R
8	Classify different protection schemes normally used for protection of a power transformer from internal faults? Discuss one of them in brief	311.3	R
	OR		
9	Show the protective scheme employed for the bus bar.	311.3	R
10	Discuss with neat sketch, the construction ad working of MOCB. Also gives its merits and demerits.	311.5	U
	OR		
11	Compare the different types of circuit breaker used for power system protection.	311.5	A
12	Discuss in detail about the recovery rate theory and energy balance theory of arc interruption in AC circuit breaker.	311.5	R
	OR		
13	Derive an expression for rate of rise of transient recovery voltage (RRRV) and hence obtain the condition for maximum RRRV.	311.5	AZ
14	With neat sketch describe the construction and operation of SF_6 circuit breakers.	311.6	R
	OR		
15	Classify Bulk oil Circuit breakers. Explain in detail the operation of different types of self blast oil circuit breakers with necessary diagrams.	311.6	R

Name of the Faculty: Dr.C.Krishnakumar, Prof & Head /EEE & Dr.M.V.Suganyadevi, ASP/EEE

QUESTION PAPER FORMAT

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III			Date/ Session	17-05-2021	Marks	50
Course code	EE8602	Course Title	Protection and Switchgear			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year	III	Semester/ Section	VI/ A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	SSkills
1	State the advantages of static relays	CO4	U
2	Define sampling theorem	CO4	R
3	Draw the block diagram of directional static over current relay	CO4	R
4	What are the various types of comparators?	CO4	A
5	State the limitations of static relays	CO4	R
6	What is meant by rate of rise of recovery voltage?	CO5	R
7	What do you mean by current chopping?	CO5	U
8	Write the classification of circuit breakers based on the medium used for arc extinction?	CO5	A
9	What is RRRV?	CO5	R
10	What is meant by electro negativity of SF6 gas?	CO5	U

Part – B

(Answer all the questions 2 x 10 = 20 marks) Maximum 2 splits/Question

Q. No.	Questions	CO	Skills
11	Explain with neat block diagram the solid state relays.	CO4	R
	OR		
12	Describe with neat block diagram the working of numerical over current protection.	CO4	U
13	Explain the construction operating principle and application of minimum oil circuit breakers.	CO5	R
	OR		
14	Describe the construction, operating principle and application of SF6 circuit breaker.	CO5	U

Part – C

(Answer all the questions 1 x 10 = 10 marks) Case study or Analytical type

Q. No.	Questions	CO	Skills
15	i. Derive the expression for restriking voltage and maximum RRRV **ii.** A 3 phase alternator has the line voltage of 11kV. The generator is connected to a circuit breaker. the inductive reactance upto the circuit breaker is 5Ω/phase. The distributed	CO6	AZ

		capacitance upto circuit breaker between phase and neutral is 0.001 μF. Determine peak restriking voltage across the circuit breaker, frequency of restriking voltage transients, average rate of restriking voltage up to peak restriking voltage.		
		OR		
16	i.	For a 132kV system, the reactance and capacitance upto the location of a circuit breaker is 3Ω and 0.015μF respectively calculate the following (a) the frequency of the transient oscillation (b) the maximum value of restriking voltage across the contacts of circuit brakers (c) the maximum value of RRRV.	CO6	A
	ii.	A 50 Hz, 3 phase alternator has rated voltage 12kV, connected to circuit breaker, inductive reactance of 5Ω/phase, C=3 μF. determine the max RRRV, peak restriking voltage, frequency of oscillations.		

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

IA -1 EE8005 -SPECIAL ELECTRICAL MACHINES

* Required

1. Email *

2. Name of the Student *

3. Batch Number *

4. REG. NO.

5. Year / Sec *

Mark only one oval.

- ◯ III Year A
- ◯ III Year B

PART-A

30*1 = 30 Marks

6. A variable reluctance stepper motor is constructed of _____ material with salient poles. 1 point

Mark only one oval.

- a) Paramagnetic
- b) Ferromagnetic
- c) Diamagnetic
- d) Non-magnetic

7. The rotor of a stepper motor has no 1 point

Mark only one oval.

- a) Windings
- b) Commutator
- c) Brushes
- d) All of the mentioned

8. A stepper motor may be considered as a _____ converter. 1 point

Mark only one oval.

- a) Dc to dc
- b) Ac to ac
- c) Dc to ac
- d) Digital-to-analogue

9. What is the difference between full-step and half-step? 1 point

Mark only one oval.

- A. In full-step two phases are on and in half-step only one phase is on.
- B. More resonance is evident in half-step
- C. More power required for full-step
- D. Half-step offers better resolution

10. Which of the following is not a component of a stepper motor? 1 point

Mark only one oval.

- A. Windings
- B. Rotor and Stator
- C. Commutator
- D. Brush
- E. Both C and D

11. If an application using a stepper motor required feedback, which device would be needed to accomplish this? 1 point

Mark only one oval.

- A. Counter
- B. Encoder
- C. Linear Guide
- D. Commutator

12. A stepper motor is also called 1 point

Mark only one oval.

- A. Digital Actuator
- B. Brush Motor
- C. Brushless DC Motor
- D. Both A and C

13. At the aligned position of stator pole and rotor pole, the reluctance offered by that motor is 1 point

Mark only one oval.

- A. Minimum
- B. Constant
- C. Maximum
- D. neither Minimum nor Maximum

14. The modes of excitation of stepper motor are classified into 1 point

Mark only one oval.

- A. 3 modes
- B. 4 modes
- C. 5 modes
- D. 2 Modes

15. The full step operation of a VR stepper motor is 1 point

Mark only one oval.

- A.15 deg
- B. less than 15 deg
- C. 30 deg
- D. Both A and B

16. The torque equation of a stepper motor is 1 point

Mark only one oval.

- A. $T=(1/2)*I * dl/d\theta$
- B. $T=(1/2)* dl/d\theta$
- C. $T=(1/2)*I2 * dl/d\theta$
- D. $T=(1/2)*I3 * dl/d\theta$

17. The _____determines the proper phase to be excited according to the position information. 1 point

Mark only one oval.

- A. Driver circuit
- B. Logical Sequencer
- C. Encoder
- D. All the above

18. Which suppressor circuit ensure fast decay of current through the winding. 1 point

Mark only one oval.

- A. Diode
- B. Diode and Resistor
- C. Diode and Zener diode
- D. All the above

19. SRM is _____and _____salient electrical motor 1 point

Mark only one oval.

- A. singly,doubly
- B. singly,singly
- C. doubly, singly
- D. All the above

20. Application of SRM 1 point

Mark only one oval.

- A. analog electric meters
- B. washing machines
- C. Electric vehicles
- D. All the above

21. Higher number of switches required in each phase, which makes the converter expensive and also used for low voltage applications. 1 point

Mark only one oval.

- A. C-dump circuit
- B. (n+1) semiconductor switches and (n+1) diodes
- C. two power switches and two diodes
- D. None of the above

22. In C-dump circuit ,the capacitor voltage is maintained at 1 point

Mark only one oval.

- A. 2 Vdc
- B. Vdc
- C. ½ Vdc
- D.Vdc/2

23. In constant power region of Torque-speed characteristics of SRM ____is maintained constant. 1 point

Mark only one oval.

- A. θ
- B. T**ω**
- C. T**ω**2
- D.T

24. For high speed of operation of SRM, the current waveform has undesirable_____ 1 point

Mark only one oval.

- A.ripple
- B.Spices
- C.Transients
- D.Harmonics

25. Which statement is true in SRM 1 point

Mark only one oval.

- A. No PM in stator and rotor
- B. not suitable for very high speed
- C. It is a self-starting machine
- D. all the above

26. The functions performed by microprocessor or computer control of SRM 1 point

Mark only one oval.

- A. open loop control
- B. signal monitoring and control
- C. no control
- D. none of these

27. In which controller circuit ,freewheeling is not possible during chopping 1 point

Mark only one oval.

- A. (n+1) switches and (n+1) diodes
- B. C-dump circuit
- C. split link circuit
- D. phase winding using bifilar wires

28. Multi-stack stepper motor is also called as 1 point

Mark only one oval.

- A. m-stack motor
- B. cascaded type motor
- C. series type motor
- D. both A and B

29. Tooth Pitch Tp= 1 point

Mark only one oval.

- A. 360
- B. 360/Ns
- C. 360/Nr
- D. Ns-Nr

30. In which motor, Stack of the stator is formed by joining two bell shaped casings 1 point

Mark only one oval.

- A. VR Motor
- B. Claw pole Motor
- C. PM Motor
- D. Hybrid Motor

31. In a stepper motor,torque corresponds to monitoring when is dL/dθ is 1 point

Mark only one oval.

- A. constant
- B. zero
- C. negative
- D.Positive

32. The case temperature of a stepper motor can be as high as about 100°c and the winding resistance therefore increases by _____per cent. 1 point

Mark only one oval.

- A. 20%
- B. 20–30%
- C. 20-25%
- D. <20%

33. The main objectives of the design of the converter of the drive 1 point

Mark only one oval.

- A. Cost
- B. Performance
- C. both A and B
- D. Only A

34. Stepper motor application in computer peripherals: 1 point

Mark only one oval.

- A. Graph plotters
- B. Floppy disk drives
- C. Digital X-Y plotters
- D. All the above

35. _____ is proportional to current speed and rate of change of inductance with rotor angle. 1 point

Mark only one oval.

- A. mutual induced emf
- B. back emf
- C. self-induced emf
- D. All the above

PART-B

15*2 = 30 Marks

36. With a stator having 8 teeth and a rotor having 6 teeth, what step angle will an application be able to achieve? 2 points

Mark only one oval.

- A. 15°
- B. 51°
- C. 20°
- D. 105°

37. Maximum Torque which the energized stepper motor can withstand without slipping from equilibrium position (rotor stationary) is called as 2 points

Mark only one oval.

- A. Detent Torque
- B. Holding Torque
- C. Pull out Torque
- D. Pull in Torque

38. A three-stack VR stepper motor has a step angle of 10º. What is the number of rotor teeth in each stack ? 2 points

Mark only one oval.

- (a) 36
- (b) 24
- (c) 18
- (d) 12

39. If a hybrid stepper motor has a rotor pitch of 36º and a step angle of 9º, the number of its phases must be 2 points

Mark only one oval.

- a) 4
- b) 2
- c) 3
- d) 6

40. The field coils of opposite poles are connected in _____such that their mmf's are additive and they are called_____. 2 points

Mark only one oval.

- A. series/parallel and bifilar windings
- B. series and phase windings
- C. parallel and phase windings
- D. series/parallel monofilar windings

41. Determine the motor torque Tm required to accelerate an initial load of 10-4Kg-m2 from ω1= 100 to ω2=300 rad/sec during 0.1 sec. The frictional load torque is 0.05Nm. 2 points

Mark only one oval.

- A.0.25 Nm
- B. 0.5 Nm
- C. 0.75 Nm
- D. 0.05Nm

42. The step angle of VR motor is 1.18^{o}. Convert it into radians 2 points

Mark only one oval.

- A. 0.025
- B. 0.0205
- C. 0.020
- D.0.002

43. A stepper motor has a step angle of 1.8^{o}.i) calculate its resolution? & ii) number of steps required for 50 revolutions? 2 points

Mark only one oval.

- A. 400 steps/rev and 1000
- B. 220 steps/rev and 10000
- C. 100 steps/rev and 100
- D. 200 steps/rev and 10000

44. The motor torque suddenly drops to a low value at certain pulse frequencies are called as 2 points

Mark only one oval.

- A. Resonance frequency
- B. Mid frequency resonance
- C. Both A and B
- D. None of the above

45. A method of damping rotor oscillations is to provide a mechanism to convert kinetic energy to joule heating is called 2 points

Mark only one oval.

- A. Electrical damping
- B. Mechanical damping
- C. Critical damping
- D. Undamped

46. _____ is one to one correspondence between the numbers of pulses applied to the stepper motor and the number of steps through which the motor has actually moved. 2 points

Mark only one oval.

- A. resolution
- B. stepping rate
- C. Synchronism
- D. All the above

47. Determine the flux linkage of SRM with the aligned inductance of 10.7mH with a phase current of 6A. 2 points

Mark only one oval.

- A. 0.062 Wb/T
- B. 0.0642 Wb/T
- C. 0.0624 Wb/T
- D. 0.642 Wb/T

48. Calculate the torque developed in SRM if the phase current is limited to 7A ,dL= 9.2mH and dθ = $\Pi/6$ 2 points

Mark only one oval.

- A. 0.4 Nm
- B. 0.45 Nm
- C. 0.43 Nm
- D. 0.04 Nm

49. For a three phase VR stepper motor give the logical sequence for two phase ON mode 2 points

Mark only one oval.

- A. 1 0 0 , 0 1 0 and 0 0 1
- B. 1 1 0, 0 1 1 and 1 0 1
- C. 1 0 0, 1 1 0, 0 1 0, 0 1 1, 0 0 1, 1 0 1
- D. A and B

50. In control circuit current is maintained more or less constant like hysteresis throughout the conduction period in each phase it is known as _____ type control. 2 points

Mark only one oval.

- A. feedback
- B. Loop
- C. PWM
- D. Hysteresis

Google Forms

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test – II			Date/ Session	29/04/2021 & FN	Marks	50
Course code	EE8005	Course Title	SPECIAL ELECTRICAL MACHINES			
Batch No.		Duration	90 mins	Academic Year	2020 – 2021	
Year	III	Semester/Section	VI / A&B	Department	EEE	

Part – A
(Answer all the questions 5 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Classify the types of BLPM motor based on windings.	C413.4	E
2	Mention the applications of brushless DC motor.	C413.4	R
3	Sketch the T - ω_m characteristics of BLPM Square wave motor.	C413.4	C
4	Summarize the assumptions made in the derivation of emf equation of sine wave motor.	C413.5	U
5	What is meant by self-control?	C413.5	U

Part – B
(Answer all the questions 5 x 8= 40marks)

Q. No.	Questions	CO	Skills
6	Describe the constructional aspect of a brushless DC motor which is employed in automotive applications with a block diagram.	C413.4	A
	Or		
7	Develop a comparison table between the commutator of conventional DC motor and electronic commutator.	C413.4	U
8	Develop a power semiconductor based inverter circuit for star connected PMBLDC Motor and sketch the firing sequence and phase current waveform for any mode	C413.4	C
	Or		
9	Derive the expression for torque of a PMBLDC motor.	C413.4	A
10	Discuss the rotor construction of a Permanent Magnet AC Motor with a neat diagram.	C413.5	
	Or		
11	Derive the emf expression of an ideal BLPM sine wave motor.	C413.5	AZ
12	A 3ϕ, 16 pole synchronous motor has a star connected winding with 144 slots and 10 conductors per solt. The flux per pole is 0.03 wb, sinusoidally distributed and the speed is 375 rpm. Find the frequency and the phase and line emf. Assume full pitched coil.	C413.5	E
	Or		
13	With a neat sketch, explain the microprocessor based control circuit of PMSM.	C413.5	R
14	Explain the concept of vector control and how it achieved in Sine wave motor.	C413.5	R
	Or		
15	Describe the construction of Phasor diagram of Permanent Magnet synchronous motor.	C413.5	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE & Mr.R.Venugopal AP/EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test – III			Date	18/05/2021	Marks	50
Course code	EE8005	**Course Title**	SPECIAL ELECTRICAL MACHINES			
Batch No.		**Duration**	90 mins	**Academic Year**	2020 – 2021	
Year	III	**Semester/Section**	VI / A&B	**Department**	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the advantages of increasing Ld/Lq ratio in SyRM?	C314.6	R
2	Compare Synchronous Reluctance Motor and Induction motor.	C314.6	E
3	Express the Torque equation of Hysteresis motor.	C314.6	U
4	List the applications of Hysteresis motor.	C314.6	R
5	What is a repulsion motor?	C314.6	U
6	Mention the disadvantages of repulsion motor.	C314.6	R
7	What are the classifications of repulsion motor?	C314.6	R
8	Define Thrust in linear IM.	C314.6	U
9	What do you mean by transverse edge effect?	C314.6	R
10	Comparison between LIM and rotary IM.	C314.6	E

Part – B
`(Answer all the questions 2 x 10= 20marks)

Q. No.	Questions	CO	Skills
6	Describe the constructional aspect of axial and radial flux machine of SynREL type of rotor	C314.6	R
	Or		
7	Develop the phasor diagram and torque equation of synchronous reluctance motor with their advantages.	C314.6	U
8	Explain the Construction and working principle of hysteresis motor.	C314.6	AZ
	Or		
9	Describe the construction and working principle of repulsion motor.	C314.6	R

Part – C
`(Answer all the questions 1 x 10= 10marks)

Q. No.	Questions	CO	Skills
10	Explain the construction and working principle of Linear Induction Motor with a neat diagram.	C314.6	R
	Or		
11	Discuss the classifications of LIM and list out their applications.	C314.6	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE & Mr.R.Venugopal AP/EEE

2021-2022 - ODD SEMESTER

INTERNAL ASSESSMENT QUESTION

PAPERS

Saranathan College of Engineering

Venkateswara Nagar, Tiruchirapalli - 12

Model Exam			Date/ Session	03/01/2022	Marks	100
Course code	EE8017	Course Title	HIGH VOLTAGE DIRECT CURRENT TRANSMISSION			
Batch No.		Duration	3 Hours	Academic Year	2021 - 2022	
Year	IV	Semester/ Section	VIII / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	List the components of HVDC Transmission system.	C410.1	R
2	Classify the different types of DC Links.	C410.1	U
3	Differentiate the terms (i) HVDC Converters (ii) Line Commutated Converters	C410.2	U
4	Define and Draw the circuit for Two and Three valve conduction.	C410.2	U
5	What is meant by high level converters?	C410.3	R
6	Define Equidistant Pulse Control and also explain the types of EPC.	C410.3	R
7	List the sources of harmonics and also effect of trouble caused by harmonics.	C410.4	R
8	Mention the criteria for the selection of Filters.	C410.4	U
9	Evaluate the power factor j^{th} terminal per unit system.	C410.5	U
10	Mention the different methods for power flow analysis.	C410.5	R

Part – B

(Answer all the questions 5 x 13 = 65 marks)

Q.No.	Questions	CO	Skills
11a.	Describe the following terms (i) Filters (ii) Circuit Breakers (iii) Reactive Power Source (iv) Smoothing Reactors.	C410.1	U
	Or		
11b.	Describe the following operational problems in HVDC Transmission Systems (i) Converter Transformer (ii) Flashover performance of HVDC Converter Stations Insulators (iii) Valve Hall Fires (iv) Problems of Ground Return.	C410.1	U
	Or		
12a.	Explain the analysis of 12-pulse converter for the Bridge type Rectifier.	C410.2	AZ
	Or		
12b.	Draw the schematic circuit diagram of a 3-phase Bridge Rectifier and explain its principle o f operation with and without overlap.	C410.2	AZ
13a.	Illustrate the principles of DC Link Control (i) Equivalent and Schematic Diagram (ii) Constant Extinction Angle (iii) Current Margin control.	C410.3	AZ
	Or		
13b.	Illustrate the block diagram of Power Control Scheme (i) Generic Model of VDCOL (ii) Converter Station (iii) Power Order (iv) Auxiliary Controller .	C410.3	U
14a.	Explain the criteria for the design of AC Filter. Also mention different circuit configuration and impendence characteristics.	C410.4	AZ
	Or		

14b.	Explain Reactive Power Requirements in steady state HVDC Systems.	**C410.4**	**AZ**
	Or		
15a.	With a neat diagram flowchart and examine the solution methodology for AC-DC Power Flow.	**C410.5**	**AZ**
	Or		
15b.	Create the mathematical modeling of HVDC Links for Power Flow Analysis.	**C410.5**	**AZ**

Part – C

(Answer the following question 1 x 15 = 15 marks)

Q.No.	Questions	CO	Skills
16a.	What is meant by Harmonic? Explain (i) Characteristics of Harmonics (ii) Non-Characteristics Harmonics.	**C410.4**	**U**
	Or		
16b.	In the Filter explain the following terms (i) Single Tuned Filter (ii) Double Tuned Filter.	**C410.4**	**U**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name: Dr.S.Vijayalakshmi & Mrs.N.Gayathri

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III			Date/Session	08.12.21/AN	Marks	50
Course code	EE8353	Course Title	ELECTRICAL DRIVES AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year/	II	Semester/Section	III	Department	MECH	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is a chopper?	205.6	U
2	What is a controlled rectifier?	205.6	U
3	What is an inverter?	205.6	U
4	What is meant by voltage control in 3 phase induction motor?	205.6	E
5	What are the types of starters used for starting of induction motors?	205.3	U
6	What is the need of a starter in DC motors?	205.3	R
7	Draw the speed-torque characteristics of a DC series motor.	205.2	R
8	What is meant by rheostatic braking?	205.2	AZ
9	What do you mean by dynamic braking?	205.2	R
10	What are the advantages of plugging?	205.2	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain in detail about the solid state Rotor resistance control of induction motor.	205.6	R
	or		
12	Explain in detail about the conventional voltage control methods of induction motor.	205.6	U
13	Explain in detail about the 3 point starter.	205.3	U
	or		
14	Explain in detail about the 4 point starter.	205.3	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss in detail about the different characteristics of a DC motor.	205.2	AZ
	or		
16	Explain dynamic and regenerative braking of DC shunt motor.	205.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: Mr.R.Balasubramanian, Assoc Prof/EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test – I			Date/ Session	08/10/2021 & FN	Marks	50
Course code	EC8353	Course Title	Electron Devices and Circuits			
Batch No.		Duration	90 mins	Academic Year	2021-2022/ ODD	
Year	II	Semester	III	Department	EEE	

Part – A (20 Marks)
(Answer all the Questions 5 * 2=10 Marks)

Q. No.	Questions	CO	Skills
1	What is an extrinsic semiconductor?	C205.1	U
2	List the applications of PN diode.	C205.1	R
3	Define barrier potential (or) barrier voltage.	C205.1	R
4	What is a voltage regulator and mention its types?	C205.1	U
5	What are the different materials used to get different colours in LED?	C205.1	U
6	What is laser diode?	C205.1	U
7	The reverses saturation current of si PN diode is 10μA. Calculate diode current for a forward bias voltage of 0.6Vat25^{o}C.	C205.1	AZ
8	Write about the terminals of BJT.	C205.2	R
9	Comparison between CB, CE and CC configuration of transistor.	C205.2	U
10	Calculate α and β of a given transistor for which IC = 5mA,IB = 50μA & ICbo =1μA.	C205.2	AZ

Part – B
(Answer all the questions 2 * 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(i) Explain the VI characteristics of PN junction diode. (6) (ii) Distinguish between Avalanche breakdown and Zener breakdown. (4)	C205.1	U
	Or		
12	(i) Derive the expression for diffusion capacitance of PN junction diode. (6). (ii) Determine the minimum and maximum load current for which the zener diode will maintain regulation. What is the minimum load resistance that can be used when zener voltage is 10V , minimum Zener current of 5mA,maximum zener current of 25mA and zener resistance of zero ohm. (4)	C205.1	U,AZ
13	Explain the working of centre tapped Full wave rectifier and derive the expression for ripple factor, Voltage, current, efficiency.	C205.1	U
	Or		
14	An AC supply of 220V, 50Hz is applied to a half wave rectifier through a transformer of turns ratio 10:1. Assume the diode is ideal and Load resistance is 100Ω. Find (i) Maximum RMS DC Values of load voltage, (ii) Maximum RMS DC value of load current,(iii) Efficiency .	C205.1	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the Input and output characteristics of CE configuration of a transistor with a neat diagram.	C205.2	U
	Or		
16	List the biasing methods of transistor and Explain any two methods with neat diagram.	C205.2	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE

Saranathan College of Engineering

Tiruchirappalli

Unit Test – I			Date/ Session	10/12/2021 & AN	Marks	50
Course code	EC8353	Course Title	Electron Devices and Circuits			
Batch No.		Duration	90 mins	Academic Year	2021-2022/ ODD	
Year	II	Semester/ Section	III	Department	EEE	

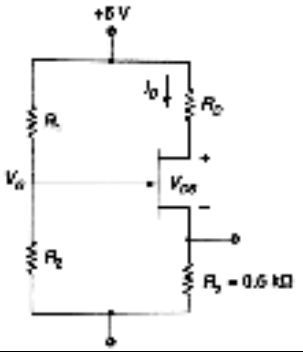
Part – A

(Answer all the Questions 5x2=10 Marks)

Q. No.	Questions	CO	Skills
1	Define Stability factor.	C205.2	U
2	What is Thermal runaway?	C205.2	R
3	Write short notes on effects of Coupling Capacitors.	C205.3	R
4	List out the classifications of Amplifiers based on i) frequency response , ii) output	C205.3	U
5	State Barkhausen criterion for an oscillator.	C205.5	U
6	Differentiate Oscillator with Amplifier.	C205.5	R
7	Write the formula to calculate the series resonant frequency and shunt resonant frequency of a crystal oscillator.	C205.5	R
8	Obtain the expression of positive feedback gain.	C205.6	U
9	List out the advantages of Negative feedback.	C205.6	C
10	Draw the block diagram of Voltage Series feedback Amplifier	C205.6	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	A Voltage-divider bias is provided to a N-channel JFET circuit as shown in fig. To establish I_{DSS}=10mA, Vp=-305V , R_1+R_2=20K Ω, I_D=5mA and $_{DS}$=5V. Determine the value of R_1 , R_2 and R_D. 	C205.2	AZ
	Or		
12	a) Discuss about the Base-Emitter feedback bias of BJT.	C205.2	R
	b) A transistor having β=100, V_{BE}=0.2V is used in fixed bias amplifier circuit where Vcc=16V, Rc=5KΩ, R_B=790 KΩ. Calculate the operating point of the transistor.		AZ
13	From the two port model of a BJT amplifier in CE configuration, derive the expression for input impedance, current gain, voltage gain and output admittance.	C205.3	A
	Or		
14	A Voltage source of internal resistance Rs=900Ω drives a CC amplifier using load resistance R_L=2000Ω.The CE h-parameters are hie=1200 Ω, hre=2x10^{-4}, hfe=60 and hoe=25μA/V. Compute the current gain, the input impedance, voltage gain and output resistance using approximate analysis and exact analysis.	C205.3	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the construction & working of Hartely oscillator and also derive the expression for frequency of oscillation.	C205.5	U
	Or		
16	a) A colpitts Oscillator have C1=7500 pf,C2=100 pf. Determine the range of inductance if frequency is varies from 950KHz to 2050KHz.	C205.5	AZ
	b) Explain the working of RC Phase shift Oscillator with a neat diagram.	C205.5	R

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name : Ms. C.Pearline Kamalini AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assesment Test - I			Date/ Session	07-10-2021/ FN	Marks	50
Course code	EE8301	**Course Title**	Electrical Machines - I			
Batch No.		**Duration**	90 mins	**Academic Year**	2021-2022	
Year	II	**Semester/ Section**	III/A	**Department**	EEE	

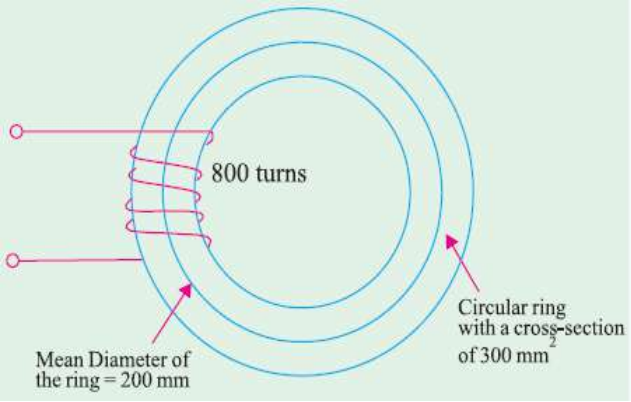
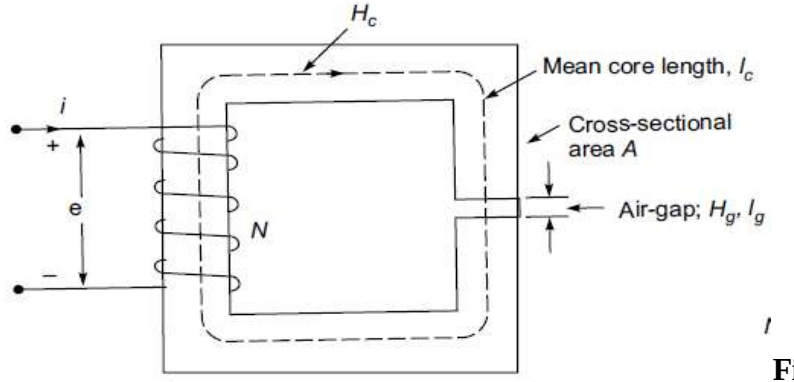
Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Enumerate the reluctance expression in terms of physical quantities.	C204.1	R
2	Distinguish between leakage flux and useful flux in magnetic systems.	C204.1	U
3	A current of 40mA is passed through a coil of self-inductance 1000mH. Find the magnetic energy stored. If the current is halved, find the new value of energy stored and the energy released back to the electrical circuit.	C204.1	E
4	What is meant by dynamically induced emf? Give example.	C204.1	U
5	State Hysteresis Steinmetz Law.	C204.1	R
6	What is the significance of the stacking factor of magnetic core?	C204.1	R
7	List any two important properties of permanent magnet materials.	C204.1	R
8	Does the transformer draw any current when secondary is opened? Why?	C204.2	
9	What are the properties of an ideal transformer?	C204.2	U
10	A transformer of 250/3000 volts and emf per turn is 8 volts. Calculate the primary and secondary turns. If the maximum flux density in the core is 1.2 wb/m^2 , what is core cross sectional area?	C204.2	E

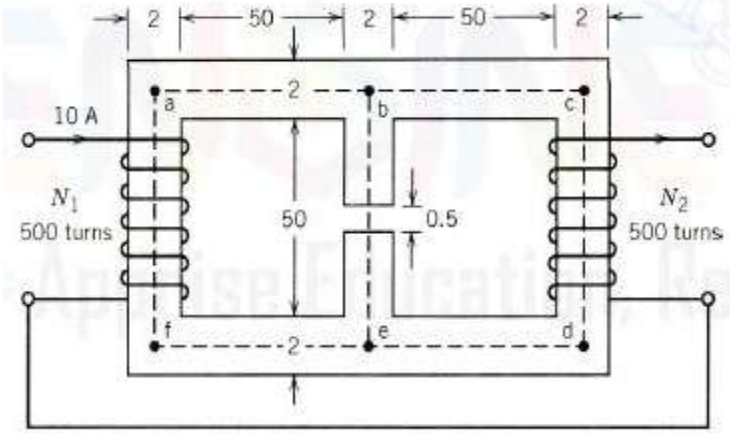
Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	A wooden ring has a circular cross-section as shown in fig.1 Calculate: **(i)** the field strength produced in the coil by a current of 2 amperes **(ii)** the magnetic flux density produced by this current and **(iii)** the current required to produce a flux density of 0.02 wb/m^2.  Figure 1	C204.1	E
	OR		
12	The magnetic circuit of Fig. 2 has dimensions: Ac = 4 X 4 cm^2, l_g = 0.06 cm, l_c = 40 cm; N = 600 turns. Assume the value of μ_r = 6000 for iron. Find the exciting current for B_c = 1.2 T and the corresponding flux and flux linkages.  **Figure 2**	C204.1	E
13	Explain briefly the construction and working principle of transformer	C204.2	U
	OR		
14	Derive an expression for emf equation of transformer with special attention on Transformation ratio.	C204.2	A

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	In the magnetic circuit of Fig.3 the relative permeability of the ferromagnetic material is 1200. Neglect magnetic leakage and fringing. All dimensions are in centimeters, and the magnetic material has a square cross-sectional area. Determine the air gap flux, the air gap flux density, and the magnetic field intensity in the air gap.  Figure 3	C204.1	E
	OR		
16	(a) The total core loss of a specimen of silicon steel is found to be 1500 W at 50 Hz. Keeping the flux density constant the loss becomes 3000 W when the frequency is raised to 75 Hz. Calculate separately the hysteresis and eddy current loss at each of those frequencies.**(6)** (b) Find the eddy current power loss in a 50 Hz transformer with a maximum flux density of 1 Wb/m^2. The core is of section 8 cm × 6 cm and total effective length is 50 cm constructed of laminations of thickness 0·4 mm. The eddy current coefficient is $6{\cdot}58 \times 10^6$. Assume a space factor of 0·9**(4).**	C204.1	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty: P. Ramesh Babu (AP/EEE)

Saranathan College of Engineering
Tiruchirapalli

Model Exam			Date/ Session	24-12-2021/AN	Marks	100
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	3 Hour	Academic Year	2021-2022	
Year	II	Semester/ Section	III/A	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Convert $(475.25)_8$ to its decimal equivalent & $(549.B4)_{16}$ to its binary equivalent	C201.1	E
2	Convert binary code 111110011 to its Gray equivalent, and Gray code 1010110100 to its binary equivalent	C201.1	E
3	State Demorgan's theorem.	C201.2	R
4	Convert the given expression in canonical SOP form Y= AC+AB+BC.	C201.2	E
5	Convert JK Flip-flop into D-FF	C201.3	E
6	What is triggering? What are the types of triggering?	C201.3	R
7	Define Transition table	C201.4	U
8	Define Hazard. What are the types of Hazards?	C201.4	U
9	What is Dataflow modeling?	C201.5	U
10	Define VHDL? What are its advantages?	C201.5	U

Part – B
(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11a	Draw the following gate circuit and explain its operation with truth table 1. ECL 2. CMOS NOR	C201.1	R
	Or		
11b	i. Generate Hamming code for the data 10111 using odd parity. ii. A 12 bit Hamming code word is read from memory. What was the original 8 bit data word that was written into memory if the 12 bit word read out is as (1)100000010100 (2)111110110100 iii. If the received hamming code as 101101101110, find the error position and correct the code using even parity.	C201.1	E
12a	I) Plot the logical expression $ABCD + A\bar{B}\bar{C}\bar{D} + A\bar{B}C + AB$ on a 4-variable K-map; obtain the simplified expression from the map. II) Express the function $Y = A + \bar{B}C$ in canonical SOP and canonical POS form.	C201.2	A
	Or		
12b	Design 4 bit Adder/Subtractor circuit	C201.2	E
13a	Explain the operation, state diagram and characteristics of T-flip-flop and master-slave JK flip-flop.	C201.3	U
	Or		
13b	Explain in detail about different shift registers	C201.3	R
14a	What is hazards? Explain hazards in digital circuits. Discuss about the hazards in asynchronous sequential circuit and the ways to eliminate them.	C201.4	U
	Or		

14b	Draw a PLA circuit to implement the functions $F_1 = AB' + AC + A'BC'$ and $F_2 = (AC + BC)'$.	C201.4	E
15a	Explain in detail of RTL with example	C201.5	U
	Or		
15b	Write a VHDL program for i. 4: 1 MUX ii. Full adder using two Half adder	C201.5	U

Part – C

(Answer all the questions 1 x 15 = 15 marks)

Q. No.	Questions	CO	Skills
16a	Design an asynchronous sequential circuit with two inputs x_1 and x_2 and one output Z. Initially, both inputs are equal to zero. When x_1 or x_2 becomes 1, the output Z becomes 1. When the second input also becomes 1, the output changes to 0. The output stays at 0 until the circuit goes back to the initial state.	C201.4	AZ
	Or		
16b	Assume that there is a parking area in a shop whose capacity is 10. No more than 10 cars are allowed inside the parking area and the gate is closed as soon as the capacity is reached. There is a gate sensor to detect the entry of car which is to be synchronized with the clock pulse. Design and implement a suitable counter using JK flip flops. Also, determine the number of flip flops to be used if the capacity is increased to 50.	C201.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff Incharge: Dr.S. Vijayalakshmi / Asso. Prof / EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/Session	06-10-2021 /FN	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2021 – 2022	
Year	II	Semester/Section	III	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the sources and effects of electromagnetic fields?	C203.1	R
2	How is the unit vectors defined in a cylindrical & spherical co-ordinate system?	C203.1	R
3	Points P and Q are located at (0,2,4) and (-3,1,5). Calculate the distance vector from P to Q.	C203.1	A
4	Given $\vec{A} = 4\,\vec{a_x} + 6\,\vec{a_y} - 2\,\vec{a_z}$ and $\vec{B} = -2\,\vec{a_x} + 4\,\vec{a_y} + 8\,\vec{a_z}$. Show that the vectors are orthogonal.	C203.1	A
5	Express in matrix form the unit vector transformation from the rectangular to cylindrical co-ordinate system.	C203.1	R
6	Explain Electric field Intensity with its equation	C203.1	A
7	Define stokes theorem	C203.1	R
8	Find the vectors defined by points (-2,1,-1) and (0,3,1)	C203.1	A
9	Convert the given rectangular coordinates A(2,3,1) into corresponding cylindrical coordinates.	C203.1	A
10	Find the divergence of the field $P=x^2yzi+xzk$	C203.1	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive Electric field Intesity due to Finite and Infinite long conductor	C203.1	R
	Or		
12	If $\vec{A} = y\,\vec{a_x} + (x+z)\,\vec{a_y}$ and a point Q is located at (-2,6,3), express (1) the point Q in cylindrical and spherical coordinates, (2) $\vec{A}$ in cylindrical and spherical coordinates.	C203.1	AZ
13	Verify divergence theorem, where $\vec{A} = 2xy\,\vec{a_x} + y^2\,\vec{a_y} + 4yz\,\vec{a_z}$ and S is the surface of the cube bounded by x = -1, x = 1, y = -1, y = 1, z = 0, z = 1.	C203.1	AZ
14	Determine the divergence of these vector fields. a) $\vec{A} = \mathbf{yz}\,\vec{a_x} + \mathbf{4xy}\,\vec{a_y} + \mathbf{y}\,\vec{a_z}$ at (1,-2,3); b) $\vec{B} = \boldsymbol{\rho z sin\phi}\,\vec{a_\rho} + \mathbf{3}\boldsymbol{\rho z^2 cos\phi}\,\vec{a_\phi}$ at (5,π/2,1) ; c) $\vec{C} = \mathbf{2rcos\theta}\boldsymbol{cos\phi}\,\vec{a_r} + \mathbf{r^{1/2}}\vec{a_\phi}$ at (1,π/6, π/3)	C203.1	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Determine the divergence of the vector fields. a) $\vec{A} = \mathbf{x^2yz}\,\vec{a_x} + \mathbf{xz}\,\vec{a_z}$; b) $\vec{B} = \mathbf{rsin\phi}\vec{a_r} + \mathbf{r^2z}\,\vec{a_\phi} + \mathbf{zcos\phi}\,\vec{a_z}$; c) $\vec{C} = \frac{\mathbf{1}}{\mathbf{r}}\mathbf{cos\theta}\,\vec{a_r} + \mathbf{rsin\theta cos\phi}\,\vec{a_\theta} + \mathbf{cos\theta}\,\vec{a_\phi}$	C203.1	AZ
	Or		
16	Express vector $\vec{B} = \frac{10}{r}\vec{a_r} + r\cos\theta\,\vec{a_\theta} + \vec{a_{\phi_\phi}}$ in Cartesian and Cylindrical coordinates. Find $\vec{B}(-3,4,0)$ and $\vec{B}\left(5,\frac{\pi}{2},-2\right)$	C203.1	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Name of the faculty*:*Prof.Gayathri Natarajan

Saranathan College of Engineering

Tiruchirappalli

Model Exam			Date/ Session	29/12/2021 & AN	Marks	50
Course code	EC8353	Course Title	Electron Devices and Circuits			
Batch No.		Duration	90 mins	Academic Year	2021-2022/ ODD	
Year	II	Semester/ Section	III / A	Department	EEE	

Part – A

(Answer all the Questions 5 x 2=10 Marks)

Q. No.	Questions	CO	Skills
1	What is diffusion capacitance of PN junction?	C205.1	U
2	A silicon diode has a saturation current of 7.5μA at room temperature 300K. Find the saturation current at 400K.	C205.1	AZ
3	Draw the drain and transfer characteristics of JFET.	C205.2	R
4	Determine the base current for the CE transistor circuit if Ic = 80 mA and β = 170.	C205.2	U
5	Draw the hybrid model of emitter follower amplifier.	C205.3	R
6	Mention the steps involved to obtain the ac equivalent circuit of an amplifier.	C205.3	AZ
7	A tuned amplifier is designed to receive AM broadcast of speech signal at 650 KHz. What is needed Q for amplifier?.	C205.4	U
8	Comparison between small signal and large signal amplifiers.	C205.4	R
9	Define Piezo electric effect.	C205.5	U
10	General characteristics of negative feedback amplifier.	C205.6	R

Part – B

(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11 a)	i) Explain the working of zener diode as voltage regulator. (8)	C205.1	A
	ii) Discuss the construction and working of Laser diode. (7)		
	Or		
11 b)	Explain the operation of Half wave rectifier and derive its various parameters.	C205.1	R
12 a)	Describe the working of SCR with necessary diagram and its V-I characteristics curve.	C205.2	U
	Or		
12 b)	i) Describe the V-I characteristics of UJT with an equivalent circuit. (7)	C205.2	U
	Ii) Explain any two biasing methods of transistor amplifier circuit. (8)		
13 a)	Draw the h-parameter model of a BJT-CE amplifier and derive the equations for voltage gain, current gain, input impedance and output impedance.	C205.3	A
	Or		
13 b)	Explain the Common Drain MOSFET amplifier and derive its input impedance, output impedance and voltage gain.	C205.3	A
14 a)	i) Explain briefly about working of BJT emitter coupled differential amplifier.(7)	C205.4	U
	ii) What is CMRR? Derive the expression for common mode and differential mode gain of differential amplifier		R
	Or		
14 b)	What is neutralization? Explain any 2 methods of neutralization techniques with necessary circuit diagram.	C205.4	R
15 a)	Discuss the principle and operation of a Colpitts oscillator with a circuit. Also deduce an expression for frequency of oscillation.	C205.5	U

Or			
15 b)	i) Explain the working of a phase shift oscillator with a neat diagram.	C205.5	U
	ii) In Hartley oscillator, two inductances L_1 = 20 µH and L_2 = 2 mH. While frequency is changed from 950 KHz to 2050 KHz. Calculate the range over which capacitor is varied.	C205.5	AZ

Part – C

(Answer all the questions 1 x 15 = 15 marks)

Q. No.	Questions	CO	Skills
16 a)	Enumerate the characteristics of voltage series feedback amplifier with a block diagram.	C205.6	A
Or			
16 b)	A CE amplifier is driven by a voltage source of internal resistance R_S = 800Ω and the load resistance is 1000 Ω. The h-parameters are h_{ie} = 1000 Ω, h_{re} = $2*10^{-4}$, h_{fe} = 50 and h_{oe}= 25µA/V. Compute the current gain ,Input impedance, Voltage gain and Output resistance using exact analysis and Approximate analysis.	C205.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms. C.Pearline Kamalini AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – I			Date/Session	05.10.21/FN	Marks	50
Course code	EE8353	Course Title	ELECTRICAL DRIVES AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year/	II	Semester/Section	III	Department	MECH	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define electrical drives.	205.1	U
2	Mention few applications of electric drives.	205.1	U
3	Mention the power rating formulae for motors with linear load.	205.1	U
4	What are the basic elements of electrical drive?	205.1	E
5	What are the advantages of Electrical drives?	205.1	U
6	What are 4 commonly used methods for the determination of power rating of motors?	205.1	R
7	What are the drawbacks of individual drive?	205.1	R
8	A dc shunt motor with a rating of 220V has an armature resistance of 1 ohms. What would be the starting current?	205.3	AZ
9	What are the types of starters used for starting of DC shunt motor?	205.3	R
10	What is the need of a starter in DC motors?	205.3	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the different types of electric drives.	205.1	R
	or		
12	What are all the Factors Influencing choice of Electrical Drives? Explain.	205.1	U
13	Explain about the classes of duty in detail.	205.1	U
	or		
14	Explain the selection of motor power rating for various loading conditions.	205.1	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain in detail about the 3 point starter.	205.3	AZ
	or		
16	Explain in detail about the 4 point starter.	205.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: Mr.R.Balasubramanian, Assoc Prof/EEE

Saranathan College of Engineering
Tiruchirapalli

MODEL EXAM			Date/Session	08.12.21	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	1.5 HOURS	Academic Year	2021 – 2022	
Year	II	Semester	III	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	How is the unit vectors defined in a cylindrical & spherical co-ordinate system?	C203.1	R
2.	Points P and Q are located at (0,2,4) and (-3,1,5). Calculate the distance vector from P to Q.	C203.1	AZ
3.	Define electric potential with its equation.	C203.3	U
4.	Write the equation for capacitance of coaxial cable.	C203.3	AZ
5.	An infinite long straight filament carrying a current of 3A is located along z-axis. Calculate the magnetic field intensity and magnetic flux density at point (1, 2, 1).	C203.4	AZ
6.	What is the practical significance of Lorentz's Force?	C203.4	AZ
7.	State and explain coulomb's law and deduce the vector form of force equation between two point charges.	C203.4	U
8.	Define electric dipole moment.	C203.2	A
9.	Obtain the unit vector in the direction from the origin towards the point P (3,-3,2).	C203.2	A
10.	Write Poissons equation for a simple medium.	C203.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a)	Express vector $\overrightarrow{B} = \frac{10}{r}\overrightarrow{a_r} + r\cos\theta\,\overrightarrow{a_\theta} + \overrightarrow{a_{\phi_\phi}}$ in Cartesian and Cylindrical coordinates. Find $\overrightarrow{B}(-3,4,0)$ and $\overrightarrow{B}\left(5,\frac{\pi}{2},-2\right)$	C203.1	R
	Or		
11 b)	(i) Point charges 1 m C and -2 m C are located at (3, 2,-1) and (-1, -1,4) respectively. Calculate the electric force on a 10nC charge located at (0,3,1) and the electric field intensity at the point. (ii) State and prove Divergence theorem	C203.1	AZ
12 a)	(i)A circular disc of radius 'a' m is charged uniformly with a charge density of σ_s C/m^2. Find the electric potential at a point P, distant 'h' m from the disc surface along its axis. (ii) Find the capacitance of parallel plate capacitor with dielectric ε_{r1}=1.5 and ε_{r2}=3.5 each occupy one half of the space between the plates of area 2m^2 and d=10^{-3}m	C203.3	U
	Or		
12 b)	(i)State and prove Magneto static boundary condition (ii)Derive an expression for capacitance of concentric spheres using Laplace equation.	C203.3	R

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
13 a)	If $\vec{A} = y\,\vec{a_x} + (x + z)\vec{a_y}$ and a point Q is located at (-2,6,3), express (1) the point Q in cylindrical and spherical coordinates, (2) $\vec{A}$ in cylindrical and spherical coordinates.	C203.2	AZ
	Or		
13 b)	A capacitor consists of squared two metal plates each 100 cm side placed parallel and 2 mm apart. The space between the plates is filled with a dielectric having a relative permittivity of 3.5. A potential drop of 500 V is maintained between the plates. Evaluate (i) The capacitance, (ii) The charge of capacitor, (iii) The electric flux density, (iv) The potential gradient.	C203.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Name of the faculty: Ms. N.Gayathri

Saranathan College of Engineering

Tiruchirapalli

Unit Test			Date/ Session	15-12-2021/AN	Marks	50
Course code	EE8301	**Course Title**	Electrical Machines - I			
Batch No.		**Duration**	90 mins	**Academic Year**	2021-2022	
Year	II	**Semester/ Section**	III/A	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	State the principle of electromechanical Energy conversion.	C204.4	R
2	Define filed energy and co energy	C204.4	U
3	Why do all practical energy conversion devices make use of the magnetic field as a coupling medium rather than electric field?	C204.4	U
4	What is commutation in Dc machine?	C204.5	U
5	What are the methods to improve commutation?	C204.5	R
6	Compare lap and wave winding	C204.5	R
7	Mention the applications Dc shunt and DC series motor.	C204.6	R
8	List the different method of speed control of DC series motor.	C204.6	
9	Why Swinburne's test cannot be performed on DC series motor?	C204.6	U
10	Which method is preferred for controlling the speed of DC shunt motor above the rated speed? Justify.	C204.6	R

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Derive the expression for stored energy and Electromagnetic torque in doubly excited system.	C204.4	U
	OR		
12	Explain the concept of rotating MMF waves in A.C machine.	C204.4	U

13	Draw and explain the characteristics of DC shunt , series and compound generator .	C204.6	A
	OR		
14	Draw and explain the characteristics of DC shunt , series and compound motor. .	C204.6	A

Part – C
(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	Two coupled coils have self and mutual inductance of $L_1 = 3 + \frac{1}{2x}$; $L_2 = 2 + \frac{1}{2x}$; $M_{12} = M_{21} = \frac{1}{2x}$ over a certain range of linear displacement x in meters. The first coil is excited by a constant current of 10A and second by a constant current of -5 A. Find: (a) Mechanical work done if *x* changes from 0.5 to 1m (b) Energy supplied by each electrical source in Part (a), (c) change in field energy in Part(a). Hence verify that the energy supplied by the sources is equal to the increase in the field energy plus the mechanical work done	C204.4	E
	OR		
16	Two coupled coils have self and mutual inductance of $L_1 = 3 + \frac{1}{2x}$; $L_2 = 2 + \frac{1}{2x}$; $M_{12} = M_{21} = \frac{1}{2x}$, Compute the value of average magnetic force at x= 0.5m if (a) both coils are connected in parallel across a voltage of 220cos314t (b) both coils are connected in series across a voltage of 220cos314t (c) Coil 2 shorted and coli 1 is connected to the same voltage as in part(a) (d) both coils in series carry a current of 0.5 cos314t	C204.4	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty: P. Ramesh Babu (AP/EEE)

Saranathan College of Engineering

Tiruchirapalli

Model Examination			Date/ Session	20-12-2021/ AN	Marks	100
Course code	EE8301	Course Title	Electrical Machines - I			
Batch No.		Duration	3 Hours	Academic Year	2021-2022	
Year	II	Semester/ Section	III/A	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Define magneto-motive force.	C204.1	R
2	Calculate the inductance and energy stored in the magnetic field of an air cored solenoid 60cm long, 5cm in diameter and wound with 500 turns, carrying a current of 10A.	C204.1	E
3	What is meant by Scott connection of transformers?	C204.2	U
4	What are the advantages of using tertiary winding in transformer?	C204.3	R
5	What is meant by rotating MMF?	C204.4	R
6	What are the different types of leakage flux in rotating Machines?	C204.4	R
7	What are effects of armature reaction in DC machine?	C204.5	R
8	Define critical field resistance and critical speed of DC generator.	C204.5	
9	In what way the 4 point starter is better than 3point starter.	C204.6	U
10	Mention the applications of PMDC motor and draw the speed -torque characteristics of the same.	C204.6	U

Part – B

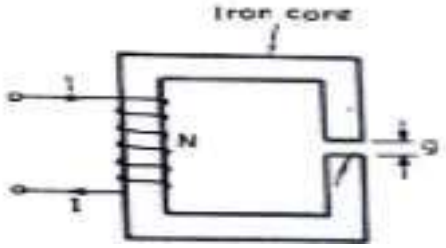
(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11(a)	Write short note on following (i) statically induced emf (ii) dynamically induced emf(iii) Hysteresis loss (iv) eddy current loss	C204.1	U
	OR		
11(b)	With neat diagram explain in detail about transformer as a magnetic coupled circuit.	C204.1	U

<table>
<tr><td rowspan="4">12(a)</td><td colspan="3">(i) Tests are performed on 1Φ ,10kVA, 2200/220V, 60 Hz transformer and the following results are obtained</td><td rowspan="4">C204.2 &3</td><td rowspan="4">E&U</td></tr>
<tr><td>Meter’s reading</td><td>O.C Test (H.V side Open)</td><td>S.C Test (L.V side Short circuited)</td></tr>
<tr><td>Voltmeter
Ammeter
Wattmeter</td><td>220 V
2.5A
100 W</td><td>150V
4.55A
215W</td></tr>
<tr><td colspan="3">Determine the parameters for approximate equivalent circuit referred to LV side.(8)
(ii) Write a short note on phasing of transformer.(5)</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>12(b)</td><td colspan="3">(i) Write short note on per unit representation of transformer.(5)

(ii)Deduce the expression for Volume of copper saved by autotransformer in terms of turns ratio when compared with a 2- winding transformer (8)</td><td>C204.2 &3</td><td>U</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>13(a)</td><td colspan="3">Derive an expression for force and torque in multiply excited system for linear and non linear case.</td><td>C204.4</td><td>E</td></tr>
<tr><td></td><td colspan="3">OR</td><td></td><td></td></tr>
<tr><td>13(b)</td><td colspan="3">Explain the concept of rotating MMF waves in A.C machine.</td><td>C204.4</td><td>E</td></tr>
<tr><td>14(a)</td><td colspan="3">(i) Derive an emf equation of DC generator(6)
(ii)A 6 pole lap wound d.c generator has 600 conductors on its armature. The flux per pole is 0.02 wb. Calculate (i) the speed at which the generator must be run to generate 300V (ii) what would be the speed if the generator were wave wound?(7)</td><td>C204.5</td><td>U&E</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>14(b)</td><td colspan="3">(i) Draw and explain the characteristics of DC shunt generator(6)
(ii) A 250 kW, 400 V, 6-pole dc generator has 720 lap wound conductors. It is given a brush lead of 2.5 angular degrees (mech). from the geometric neutral. Calculate the cross and demagnetizing turns per pole. Neglect the shunt field current.(7)</td><td>C204.5</td><td>U&E</td></tr>
<tr><td>15(a)</td><td colspan="3">(i) Derive an expression for torque equation of DC motor.(6)
(ii) A 4-pole dc motor is lap-wound with 400 conductors. The pole shoe is 20 cm long and average flux density over one-pole-pitch is 0.4 T, the armature diameter being 30 cm. Find the torque and gross mechanical power developed when the motor is drawing 25 A and running at 1500 rpm.(7)</td><td>C204.6</td><td>U&E</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>15(b)</td><td colspan="3">(i) With neat diagram Explain the working principle of 4 point starter(7)
(ii) Write short note on plugging, dynamic braking and regenerative braking of DC shunt motor(6)</td><td>C204.6</td><td>U&E</td></tr>
</table>

Part – C
(Answer all the questions 1 x 15= 15 marks)

Q. No.	Questions	CO	Skills
16(a)	The following test results were obtained while Hopkinson's test was performed on two similar dc shunt machines: Supply voltage =250V, field current of motor=2A, field current of generator=2.5A, Armature current of generator=60A, current taken by the two armatures from the supply =15A, Resistance of each armature circuit =0.2 ohms, calculate the efficiency of the motor and generator under these conditions of load.	C204.6	E
	OR		
16(b)	For the magnetic circuit of fig,1 length of iron path =120cm, g=0.5cm, area of cross section of iron=5 X 5 cm^2 ,μ_r = 1500, I=2A, N=1000 turns. Calculate and compare the field energy stored and field energy density in iron as well as in airgap. Neglect fringing and leakage flux.  Fig.1	C204.3	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty : P. Ramesh Babu (AP/EEE)

Saranathan College of Engineering
Tiruchirapalli

MODEL EXAM			Date/Session	27.12.21/AN	Marks	100
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	3 HOURS	Academic Year	2021– 2022	
Year	II	Semester	III	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What are the sources and effects of electromagnetic fields?	C203.1	R
2.	A= 25r sin Φ. Determine the gradient of A at point P ($\sqrt{2},\frac{\pi}{2}$, 5) defined in cylindrical co-ordinate system.	C203.1	AZ
3.	Define electric potential and potential difference.	C203.3	U
4.	Write the equation for capacitance of coaxial cable.	C203.3	AZ
5.	An infinite long straight filament carrying a current of 3A is located along z-axis. Calculate the magnetic field intensity and magnetic flux density at point (1, 2, 1).	C203.4	AZ
6.	A current of 3A flowing through an inductor of 100mH. What is the energy stored in the inductor?	C203.4	AZ
7.	Write the expression for the torque experienced by a current carrying loop placed in the magnetic field.	C203.4	U
8.	Define Brewster angle.	C203.6	A
9.	Define standing wave ratio.	C203.6	A
10.	Write down the values of $\alpha_{,,,}$ velocity and intrinsic impedance for free space.	C203.6	R

Part – B

(Answer all the questions 5 x 13 = 65marks)

Q. No.	Questions	CO	Skills
11 a)	(i)Write short notes on (i) gradient (ii) curl (iii) divergence (iv) divergence theorem with its physical significance. (8) (ii) State and prove Gauss law. (5)	C203.1	R
	Or		
11 b)	(i)Derive an expression for Electric Field Intensity at a point due circular disc.(8) (ii)Transform $4\vec{a_x}$ -$2\vec{a_y}$-$4\vec{a_z}$ at (2,3,5) to cylindrical co-ordinates.(5)	C203.1	AZ
12 a)	(i)Derive an expression for potential (V) and electric field intensity ($\vec{E}$) due to an Electric Dipole. (8) (ii)A circular disc of radius 'a' m is charged uniformly with a charge density of σ_s C/m^2. Find the electric potential at a point P, distant 'h' m from the disc surface along its axis. (5)	C203.3	U
	Or		
12 b)	(i)Derive the boundary conditions of the normal and tangential components of electric field at the interface of two media with different dielectrics.(7) (ii)Derive an expression for capacitance of concentric spheres using Laplace equation.(6)	C203.3	R
13 a)	(i) Derive the expression for magnetic flux density and magnetic field intensity due to an infinitely long conductor. (10) (ii) An infinite long straight filament carrying a current of 3A is located along z-axis. Calculate the magnetic field intensity and magnetic flux density at point (1, 2, 1).(3)	C203.4	R
	Or		
13 b)	(i) For a finite current sheet of uniform current density 'k' A/m, Derive the expression for the magnetic field intensity.(6)	C203.4	AZ

	(ii) Derive the expressions for inductance due to solenoid and toroid coil. (4+3)		
14 a)	**(i) Derive the expressions for boundary conditions in magnetic fields. (8)** **(ii) Determine the torque on a rectangular loop carrying current I and placed in a uniform magnetic field.(5)**	**C203.5**	**A**
	Or		
14 b)	**With necessary explanation, derive the Maxwell's equation in differential and integral forms for Time varying fields & Time harmonic fields.**	**C203.5**	**R**
15 a)	**Derive the equation for plane waves in** **(i) Free space.** **(ii) Homogeneous material (perfect dielectrics).** **(iii) Conducting medium.**	**C203.6**	**R**
	Or		
15 b)	**Brief about Poynting vector and theorem**	**C203.6**	**AZ**

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16 a)	**A particular vector field $\vec{D}$ = $r^2\cos^2\phi\,\vec{a_r}$ +$z\sin\phi\vec{a_\phi}$ is in cylindrical system. Find the flux emanating due to this field from the closed surface of the cylinder $0 \le z \le 1$, r=4. Verify divergence theorem.**	**C203.1**	**AZ**
	Or		
16 b)	**A uniform plane wave in a medium having $\sigma = 10^{-3}$ S/m, $\varepsilon = \varepsilon_0$, $\mu_r = 1$, is having a frequency of 10KHz.** **i) Verify whether the medium is good conductor** **ii) Calculate the following,** **1) Attenuation constant** **2) Phase constant** **3) Propagation constant** **4) Intrinsic impedance** **5) Wave length** **6) Velocity of propagation**	**C203.1**	**AZ**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Name of the faculty: Ms. N.Gayathri

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III			Date/ Session	25-11-21/FN	Marks	50
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year	II	Semester/ Section	III /A	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1.	List the different types of hydro power plants according to the availability of water	C206.4	R
2.	What are the various functions of surge tank in hydro power plant?	C206.4	AZ
3.	Mention the various advantages of wind power	C206.4	R
4.	What are the principle of photo voltaic conversion?	C206.5	U
5.	What is bio gas? list the advantages of bio gas	C206.5	U
6.	Compare two and three part tariff	C206.5	R
7.	Define load factor and capacity factor	C206.6	U
8.	List down the nuclear waste disposal methods	C206.6	R
9.	Define load curve	C206.6	A
10.	What are the different cost in a power plant?	C206.6	R

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11.	Explain the arrangement of layout of a hydroelectric power plant with neat sketch. Also explain in detail the various elements of hydro electrical power plant	C206.4	A
	OR		
12.	Discuss in detail the construction and working of horizontal and vertical axis wind mill	C206.4	U
13.	What is bio gas? Explain the process for generating bio gas. Also discuss the advantages and disadvantages	C206.5	AZ
	OR		
14.	Explain the construction and working of hydrogen - oxygen fuel cell	C206.5	U

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15.	Write a detailed notes on the nuclear waste disposal and different methods adopted for controlling the nuclear pollution	C206.6	U
	OR		
16.	Define tariff. What are the desirable characteristics of tariffs? Write a short notes on the various types of tariffs.	C206.6	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Unit Test - 1			Date/Session	13-12-21	Marks	50
Course code	EE8351	**Course Title**	DIGITAL LOGIC CIRCUIT			
Batch No.		**Duration**	90 mins	**Academic Year**	2021 - 2022	
Year/	II	**Semester/Section**	III/A	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Reduce AB + (AC)' + AB'C (AB + C)	C202.1	E
2	Convert i. (54)10 = ( )$_8$ ii. (1100000110001 1001)2 = ( )$_{16}$	C202.1	R
3	Compare PROM, PLA and PAL	C202.4	E
4	Give the classification of PLDs.	C202.4	AZ
5	What are races and cycles?	C202.4	E
6	Define Hazard. What are the types of Hazards?	C202.4	R
7	What are the various modeling used in VHDL?	C202.5	A
8	Give the different arithmetic operators?	C202.5	R
9	Give the different bitwise operators.	C202.5	E
10	What is the structural gate-level modeling?	C202.5	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11a	Generate the even parity hamming codes for transmitting the 5 bit data 10001 with step-by step procedure.	C202.1	E
11b	Retrieve the correct BCD codes from the given received hamming codes 11111011101 using odd parity	C202.1	A
	or		
12	Explain the operation of i. TTL NAND logic ii. CMOS NAND logic	C202.1	E
13	An asynchronous sequential circuit is described by the following excitation and output function. Y = X1X2 + (X1+X2) Y Z = Y i. Draw the logic diagram of the circuit ii. Derive the transition table and output map. Iii. Describe the behavior of the circuit	C202.4	C
	or		
14	Implement the following Boolean functions using PAL. W(A,B,C,D) = ∑m(1,2,5,7,8,10,12,13) X(A,B,C,D) = ∑m(0,2,6,8,9,14) Y(A,B,C,D) = ∑m(0,3,7,9,11,12,14) Z(A,B,C,D) = ∑m(1,2,4,5,9,10,14)	C202.4	E

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Write VHDL program for 8:1 MUX using behavioral modeling	C202.5	C
or			
16	Write the VHDL program for 4 bit counter	C202.5	C

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Staff Incharge: Dr.S. Vijayalakshmi / Asso. Prof / EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/Session	29.10.21/FN	Marks	50
Course code	EE8353	Course Title	ELECTRICAL DRIVES AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year/	II	Semester/Section	III	Department	MECH	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the different types of squirrel cage induction motor starters?	205.4	U
2	Which type of starter is exclusively used for slip ring induction motor?	205.4	U
3	What are the drawbacks of auto-transformer starter?	205.4	U
4	What are the advantages of star-delta starter?	205.4	E
5	What are the methods of speed control of dc motors?	205.5	U
6	Why is armature voltage control used below rated speed?	205.5	R
7	What is meant by flux or field control in dc motors?	205.5	R
8	Write down the expression relating the speed, voltage and flux of a dc motor.	205.5	AZ
9	What is meant by time ratio control?	205.5	R
10	List out the advantages of Ward-Leonard control.	205.5	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the operation of a Rotor Resistance Starter.	205.4	R
	or		
12	Explain the operation of a Star-Delta starter.	205.4	U
13	Explain the different field control method of dc motors.	205.5	U
	or		
14	Explain rheostatic control methods for speed control of dc motors.	205.5	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Describe Ward-Leonard speed control system for DC motor with a neat diagram.	205.5	AZ
	or		
16	Explain the operation of chopper control of dc motor.	205.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question.

Faculty in Charge: Mr.R.Balasubramanian, Assoc Prof/EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test – II			Date/ Session	01/11/2021 & FN	Marks	50
Course code	EC8353	Course Title	Electron Devices and Circuits			
Batch No.		Duration	90 mins	Academic Year	2021-2022/ ODD	
Year	II	Semester	III	Department	EEE	

Part – A (20 Marks)

(Answer all the Questions 5 * 2=10 Marks)

Q. No.	Questions	CO	Skills
1	What is Pinch-off voltage in JFET?	C205.2	U
2	When a reverse gate voltage of JFET changes from 4.0 to 3.9V, the drain current changes from 1.3 to 1.6mA.Find the value of transconductance.	C205.2	AZ
3	Mention the biasing methods of JFET.	C205.2	R
4	Comparison between MOSFET and JFET	C205.2	U
5	Draw the basic structure and equivalent circuit of UJT.	C205.2	U
6	Define the term i) Latching current & ii) Holding current.	C205.2	U
7	What is the need for coupling capacitors in amplifier design?	C205.2	U
8	List out the notations used to obtain the transistor hybrid model.	C205.3	R
9	Why hybrid parameters are called so? Define them.	C205.3	U
10	Write the conversion formula of CC from CE to find the h-parameters.	C205.3	U

Part – B

(Answer all the questions 2 * 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the operation of N-channel JFET with a neat diagram.	C205.2	U
	Or		
12	i) Comparison between E-MOSFET and D-MOSFET. ii) Discuss the biasing of MOSFET with common source circuit.	C205.2	U,A
13	Explain the static V-I characteristics of SCR with a neat diagram and its applications.	C205.2	U
	Or		
14	Explain the working and principle of operation of UJT and mention its applications.	C205.2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	From the two port model of a BJT amplifier in CE configuration derive the expression for input impedance, current gain, voltage gain and output admittance.	C205.3	A
	Or		
16	Obtain the hybrid model of a transistor in three different configuration of a two port network.	C205.3	C

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms.C.Pearline Kamalini AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	02-11-2021/ FN	Marks	50
Course code	EE8301	**Course Title**	Electrical Machines - I			
Batch No.		**Duration**	90 mins	**Academic Year**	2021-2022	
Year	II	**Semester/ Section**	III/A	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	Why is transformer rated in KVA? What happens if DC supply is applied to the transformer?	C204.3	R
2	Define voltage regulation of a transformer	C204.3	U
3	Draw the phasor diagram of practical transformer on no load.	C204.3	U
4	What is the condition for load current maximum efficiency of transformer?	C204.3	R
5	Define All day efficiency of a transformer.	C204.3	R
6	S.C test is always conducted on H.V side-Why?	C204.3	R
7	What is singly excited and multi excited magnetic field system?	C204.4	R
8	Define Field energy and Co- energy.	C204.4	U
9	Energy stored in a magnetic field occurs mainly in the air gap-Why?	C204.4	U
10	Why do all practical energy conversion devices make use of the magnetic field as a coupling medium rather than an electric field?	C204.4	U

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Draw and explain the phasor diagram of single phase transformer operating on upf, lagging and leading load.	C204.3	U
	OR		
12	Develop an equivalent circuit of transformer with step by step procedure.	C204.3	U
13	Derive an expression of field energy and co energy in singly excited electromechanical unit.	C204.4	A
	OR		
14	Explain the following in singly excited system (i) Electrical energy input (ii) magnetic field energy stored (iii) filed energy and co-energy (iv) energy density and co energy density.	C204.4	A

Part – C

(Answer all the questions 1 x 10 = 10 marks)

<table>
<tr><th>Q. No.</th><th colspan="4">Questions</th><th>CO</th><th>Skills</th></tr>
<tr><td rowspan="4">15</td><td colspan="4">Tests are performed on 1Φ ,10kVA, 2200/220V, 60 Hz transformer and the following results are obtained</td><td rowspan="4">C204.3</td><td rowspan="4">E</td></tr>
<tr><td>Meter’s reading</td><td>O.C Test
(H.V side Open)</td><td>S.C Test
(L.V side Short circuited)</td></tr>
<tr><td>Voltmeter
Ammeter
Wattmeter</td><td>220 V
2.5A
100 W</td><td>150V
4.55A
215W</td></tr>
<tr><td colspan="3">(a) Determine the parameters for approximate equivalent circuit referred to LV side. (b) Determine the voltage regulation in percent for 50% full load 0.8 pf lagging. (c) Efficiency at 50% rated output and p.f 0.8</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td>16</td><td colspan="4">A transformer has its maximum efficiency of 0.98 at 15kVA at upf. Compare its all day efficiency for the following load cycles.
(a) full load of 20kVA , 12 hours/day and no load for rest of the day
(b) Full load 4 hours/day and 0.4 full load rest of the day. Assume unity p.f load all day.</td><td>C204.3</td><td>E</td></tr>
</table>

Bloom’s Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty : P. Ramesh Babu (AP/EEE)

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test – II			Date/Session	28.10.2021	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	1 ½ hours	Academic Year	2021-2022/ODD	
Year	II	Semester	03	Department	EEE	

Part – A (10 x 2 = 20 Marks)

I. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
1	Design a half Subtractor.	C202.2	U
2	Define DeMUX	C202.2	U
3	What is encoder?	C202.2	A
4	Draw 4-bit Adder circuit	C202.2	A
5	Express the Characteristic equation of SR-FF	C202.3	A
6	Convert JK Flip-flop into D-FF	C202.3	A
7	Compare Combinational and Sequential Circuit	C202.3	U
8	Express the excitation table for T-FF	C202.3	A
9	Express the truth table for JK-FF	C202.3	A
10	What is triggering? What are the types of triggering?	C202.3	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Design Full Adder circuit using logic gates. Also design full adder using two half adder.	C202.2	AZ
	Or		
12	Short notes on 1. Multiplexer (8:1) 2. Priority Encoder	C202.2	AZ
13	a. Implement the following Boolean function using 8:1 multiplexer. $F(A,B,C,D) = \sum m(0,2,6,10,11,12,13,14)$ (5) b. Implement the full subtractor using 3:8 decoder (5)	C202.2	AZ
	Or		
14	Design a Seven segment Decoder and implement using logic gates	C202.2	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Design JKMS - FF and explain the operation using Truth table and waveforms	C202.3	AZ
	Or		
16	Define Shift registers. Explain any two types of shift registers	C202.3	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.S.Vijayalakshmi

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – II			Date/Session	29-10-2021 /FN	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2021 – 2022	
Year	II	Semester/Section	III	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Find the electric field intensity in free space if $\vec{D} = 30\ a_x\ C/m^2$.	203.2	E
2	State the properties of electric flux lines.	203.2	U
3	Write down the Poisson's and Laplace equations and give the significant physical differences.	203.2	A
4	Define dipole moment and electric polarization.	203.2	R
5	Distinguish electric scalar potential and potential difference.	203.2	U
6	Determine Biot Savarts Law	203.4	A
7	Define Magnetic Field Intensity	203.4	A
8	Define Electro static Energy and its Energy Density	203.3	A
9	Find the capacitance when charge is 20 C has a voltage of 1.2V.	203.3	A
10	Define Equipotential Surfaces.	203.3	A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive an expression for potential (V) and electric field intensity ($\vec{E}$) due to an Electric Dipole and also derive potential due to infinite uniformly charged line.	203.3	E
	Or		
12	Derive an expression for the capacitance of a parallel plate capacitor and coaxial cable	203.3	E
13	Derive an expression for Electric Field Intensity at a point due to finite and an infinite conductor of wire.	203.2	E
	Or		
14	Determine the Electric boundary condition for Dielectric-to-Dielectric Medium	203.2	E

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Determine the Magnetic field Intensity due to infinte long straight filament.	203.4	AZ
	Or		
16	Derive an expression for Electric Field Intensity at a point due to infinite sheet and circular disc.	203.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Name of the faculty : Prof. Gayathri Natarajan

Saranathan College of Engineering

Tiruchirappalli

Internal Assessment Test – II			Date/ Session	26/11/2020 & FN	Marks	50
Course code	EC8353	Course Title	Electron Devices and Circuits			
Batch No.		Duration	90 mins	Academic Year	2020-2021/ ODD	
Year	II	Semester/ Section	III / A	Department	EEE	

Part – A (20 Marks)

(Answer all the Questions 5 x 2=10 Marks)

Q. No.	Questions	CO	Skills
1	Compare the characteristics of CE,CB and CC Amplifier.	C205.3	U
2	What is a mean by simplified hybrid model of transistor?	C205.3	R
3	State the reason for choosing 3dB point to determine the bandwidth.	C205.3	R
4	Define CMRR of a differential amplifier.	C205.4	U
5	List the advantages of Tuned Amplifier.	C205.4	R
6	A Multistage amplifier employs 5 stages each of which has a power gain of 30. What is the Overall gain in dB.	C205.4	AZ
7	When two signals V_1 and V_2 are connected to the two inputs of a differential amplifier, Define a differential signal ($V_{d)}$ and common mode signal (V_c).	C205.4	U
8	What is neutralization?	C205.4	R
9	List the advantages of single tuned amplifier.	C205.4	U
10	What are the classifications of Power Amplifier?	C205.4	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain the small signal model of a MOSFET under CS arrangement and obtain the expression for Voltage gain, Input resistance and output admittance.	C205.3	A
	Or		
12	Obtain the hybrid model of emitter follower circuit and derive the expression for Current gain, Voltage gain, Input Impedance and Output Impedance.	C205.3	R
13	Illustrate the operation of symmetrical Emitter Coupled Differential Amplifier with a neat circuit diagram in 1) differential mode and 2) Common mode.	C205.4	U
	Or		
14	i) Discuss the operation of RC Coupled amplifier using transistor. ii) Write short notes on single tuned Capacitive Coupled Transistor Amplifier.	C205.4	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Discuss the D.C. analysis of differential amplifier to obtain the parameters.	C205.4	A
	Or		
16	A CE amplifier is driven by a voltage source of internal resistance R_s=800Ω and the load resistance is 1000 Ω.The h-parameters are h_{ie}=1000 Ω, h_{re}=2*10^{-4}, h_{fe}=50 and h_{oe}=25μA/V. Compute the current gain ,Input impedance, Voltage gain and Output resistance using exact analysis and Approximate analysis.	C205.4	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Ms. C.Pearline Kamalini AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	27-11-2021/ FN	Marks	50
Course code	EE8301	**Course Title**	Electrical Machines - I			
Batch No.		**Duration**	90 mins	**Academic Year**	2021-2022	
Year	II	**Semester/ Section**	III/A	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1	What are the major Parts of a DC Machine?	C204.5	R
2	What are the conditions for buildup of voltage in self excited generator?	C204.5	U
3	Define Armature reaction. What are the main effects of armature reaction?	C204.5	U
4	What is the function of commutator?	C204.5	U
5	Define critical filed resistance and critical speed in shunt generator.	C204.5	R
6	Mention the significance of back emf in DC motor.	C204.6	R
7	Write down the expression for electrical output power which equivalent to mechanical output power in DC motor.	C204.6	R
8	What is the necessity of starter for DC motor?	C204.6	
9	What are the factors affects the speed control of DC motor?	C204.6	U
10	Why a series motor should not be started without any load?	C204.6	R

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Derive an expression for the emf generated in a DC generator	C204.5	U
	OR		
12	Explain with neat sketches the effect of armature reaction in a DC generator.	C204.5	U

13	Derive an expression for shaft torque and electromagnetic torque in a DC Motor.	C204.6	U
	OR		
14	Explain with neat sketch the working principle of Four point starter.	C204.6	A

Part – C
(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	A 10kW, 250V DC shunt machine has an armature and filed resistances of 0.1 ohms and 125 ohms respectively. Calculate the total armature power developed when running (a) As a motor taking 10kW input (b) As a generator delivering 10kW as output	C204.6	E
	OR		
16	A 75 kW, 500V , DC shunt motor has 4 poles and wave connected armature winding with 492 conductors. The flux per pole is 0.04 wb and the full load efficiency is 91%. The armature and commutating pole windings have a total resistance of 0.08Ω and shunt field resistance is 200Ω. Calculate for full load (1) the speed (2) Useful torque delivered to the load and (3) The torque developed.	C204.6	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty: P. Ramesh Babu (AP/EEE)

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test – III			Date/Session	23.11.2021	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	1 ½ hours	Academic Year	2021-2022/ODD	
Year	II	Semester	03	Department	EEE	

Part – A

Answer all the Questions (10 x 2 = 20 Marks)

Q. No.	Questions	CO	Skills
1	What are the two models in synchronous sequential circuits	C202.3	U
2	Draw the state diagram of JK – FF.	C202.3	U
3	Write the characteristic equation of T-FF	C202.3	U
4	Define Preset and Reset	C202.3	A
5	Draw the block diagram of Asynchronous circuit	C202.3	A
6	Draw the 4-bit ring counter.	C202.3	A
7	Differentiate Moore and Mealy circuit	C202.3	AZ
8	Draw the 3-bit asynchronous counter	C202.3	U
9	Differentiate synchronous & asynchronous sequential circuit	C202.4	U
10	Define Transition table	C202.4	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Design a Binary ripple counter	C202.3	AZ
	Or		
12	Design Mod-9 Asynchronous counter	C202.3	AZ
13	Design and explain the operation of Mod-5 synchronous counter	C202.3	AZ
	Or		
14	Design the synchronous sequence of 1-3-2-6-4-0-1	C202.3	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Design an asynchronous sequential circuit that has two inputs X2 and X1 and one output Z. When X1 = 0, the output Z is 0, The first change in X2 that occurs while X1 is 1 will cause output Z to be 1. The output Z will remain 1 until X1 returns to 0.	C202.4	AZ
	Or		
16	Design an asynchronous sequential circuit which has two inputs X & Y and a single output which behaves in the following manner. Initially both inputs and outputs are equal to zero. Whenever X=1 & Y=0, Z becomes 1. Whenever X=0, Y=1, Z becomes zero. When both inputs are zero or one, output does not change.	C202.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge : Dr.S.Vijayalakshmi

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test – III			Date/Session	24-11-2021 /FN	Marks	50
Course code	EE 8391	Course Title	ELECTROMAGNETIC THEORY			
Batch No.		Duration	90 mins	Academic Year	2021– 2022	
Year	II	Semester	III	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define the Lorentz force of a charge with its equation	C203.5	A
2	Difference between Mutual and Self Inductance	C203.5	A
3	Explain Conduction Current	C203.5	A
4	Explain Magnetization with proper example	C203.6	A
5	List out the Integral form of all four Maxwell Equation	C203.6	R
6	Write the differential form of "Law of non-existence of isolated monopoles".	C203.5	R
7	A charged particle passes through a magnetic field without experiencing any force. What can you conclude about the magnetic field?	C203.5	R
8	State amperes circuital law.	C203.5	U
9	Write down the magnetic boundary conditions.	C203.5	R
10	State Biot-savarts law.	C203.5	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Derive the expressions for magnetic field intensity due to long straight filament	C203.5	U
	or		
12	Derive the expressions for magnetic field intensity due to coaxial cable	C203.5	U
13	Derive the Wave Equation with its parameter	C203.6	U
	Or		
14	Relation between field theory and circuit theory	C203.6	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Derive the expression for conduction current and displacement current	C203.5	U
	or		
16	Explain Maxwells equation 1 with its equation	C203.5	R & U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C).

Saranathan College of Engineering

Tiruchirapalli

Unit Test 1			Date/ Session	02-12-21/AN	Marks	50
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year	II	Semester/ Section	III /A	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1.	What are the process involved in Rankine cycle ?	C206.1	R
2.	Define Cogeneration systems.	C206.1	AZ
3.	Differentiate Super Critical Boilers from FBC Boilers	C206.1	R
4.	Define Heat rate	C206.1	U
5.	Draw the P-V and T-S diagram of Otto cycle	C206.2	U
6.	What are the basic the components of diesel power plant?	C206.2	R
7.	What are the improvisations can be made with Brayton cycle to improve the efficiency?	C206.2	U
8.	What is the function of control rods?	C206.3	R
9.	What is nuclear fission and fusion ?	C206.3	A
10.	What are the Safety measures for Nuclear Power plants.?	C206.3	R

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11.	Discuss in detail the Layout of modern coal power plant with neat diagram	C206.1	**A**
	OR		
12.	Write detailed note on the Fuel and ash handling with relevant sketch.	C206.1	**U**
13.	Describe in detail the processes involved in Brayton Cycle with neat TS and PV diagrams, Also find the efficiency of Brayton cycle .	C206.2	**AZ**
	OR		
14.	Discuss in detail the Integrated Gasifier based Combined Cycle systems with neat diagrams	C206.2	**U**

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15.	Write a detailed note on 1. Boiling Water Reactor (BWR), **2.** Pressurized Water Reactor (PWR)	C206.3	**U**
	OR		
16.	Draw the Layout and subsystems of Nuclear Power Plants and explain the various parts of nuclear power plant. Also explain the Working of Nuclear Reactors	C206.3	**U**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – II			Date/ Session	30-10-21/FN	Marks	50
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year	II	Semester/ Section	III /A	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1.	List the methods of fuel injection in diesel power plant	C206.2	R
2.	What are the various factors to be considered while selecting the site for diesel power plant?	C206.2	AZ
3.	List the ways to improve thermal efficiency in Brayton cycle.	C206.2	R
4.	What are the various types of fuels used in gas turbine power plant?	C206.2	AZ
5.	What is the function of control rods in nuclear reactor?	C206.3	U
6.	What are the functions of cladding?	C206.3	U
7.	Define "electron Volt" with reference to Nuclear Power plants.	C206.3	R
8.	Why pressurized heavy water reactor is preferred reactor in India?	C206.3	AZ
9.	Define – Binding energy.	C206.3	R
10.	What is CANDU type reactor?	C206.3	U

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11.	List the different methods of cooling diesel engine and explain any two with neat diagram.	C206.2	A
	OR		
12.	Explain in detail about the construction and working of Integrated Gasifier based Combined Cycle system (IGCC).	C206.2	U
13.	With neat sketch, explain the layout of diesel power plant.	C206.2	AZ
	OR		
14.	With neat pv and Ts diagram, explain in detail the Brayton cycle and also derive the expression for thermal efficiency.	C206.2	U

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15.	Explain with a neat diagram the various parts of nuclear power plant and mention the functions of each parts in detail.	C206.3	U
	OR		
16.	Explain in detail the components and working of PWR with a schematic diagram	C206.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Model Exam			Date/ Session	31-12-21/AN	Marks	100
Course code	ME8792	Course Title	Power Plant Engineering			
Batch No.		Duration	3hrs	Academic Year	2021-2022	
Year	II	Semester/ Section	III /A	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	CO	Skills
1.	What do you mean by co-generation?	C206.1	R
2.	What are super critical boilers?	C206.1	AZ
3.	Draw the p-V and T-s diagram of Brayton cycle.	C206.2	R
4.	Why is the maximum cycle temperature of gas turbine plant much lower than that of diesel power plant?	C206.2	U
5.	List down the nuclear waste disposal methods.	C206.3	U
6.	What is "half life" of nuclear fuels?	C206.3	R
7.	What is the purpose of surge tank in a hydroelectric power plant?	C206.4	U
8.	What is the purpose of surge tank in a hydroelectric power plant?	C206.4	R
9.	What is load factor	C206.5	A
10.	Define tariff	C206.6	R

Part – B

(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11 a	Discuss in detail the Layout of modern coal power plant with neat diagram	C206.1	A
	OR		
11 b	Write detailed note on the Fuel and ash handling with relevant sketch.	C206.1	U
12a	(a) Explain with the help of a block diagram the fuel storage and supply system of diesel power plant. (b) Explain with the help of a block diagram the water cooling system of diesel power plant.	C206.2	AZ
	OR		
12 b	Discuss in detail the Integrated Gasifier based Combined Cycle systems with neat diagrams	C206.2	U
13 a	Explain the construction and working of Nuclear power plant with a layout.	C206.3	A
	OR		
13 b	Write a detailed note on 1. Boiling Water Reactor (BWR), 2. Pressurized Water Reactor (PWR)	C206.3	Z
14 a	Explain the construction and working of Hydel power plant with a layout.	C206.4	U
	OR		
14 b	(a) Explain the terms catchment area, rain fall and run off. (b) Explain the arrangement of the components of a hydroelectric power plant with a neat sketch.	C206.4	AZ

15 a	Define tariff and various types of tariffs in detail.	C206.5	**U**
	OR		
15 b	The maximum load on a thermal power plant of 60MW capacity is 50 MW at an annual load factor of 50%. The loads having maximum demands of 25MW, 20MW,8MW and 5MW are connected to the power station. Determine average load on power station, energy generated per year demand factor and diversity factor	C206.5	**A**

Part – C

(Answer all the questions 1 x 15 = 15 marks)

Q. No.	Questions	CO	Skills
16 a	A hydro power plant is to be used as peak load plan at an annual load factor of 30%. The average electrical energy obtained during the year is $750X10^5$ kWH. Determine the maximum demand. if the plant capacity factor is 24% find the reserve of the plant .	C206.6	**A**
	OR		
16.b	(a) What are the advantages and disadvantages of breeder reactor? (5) (b) What do you mean by fission of nuclear fuel? (5) (c) Explain briefly about radiation hazards and shielding? (5)	C206.6	**U**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - I			Date/ Session	05-10-2021/FN	Marks	50
Course code	EE8351	Course Title	Digital Logic Circuits			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year	II	Semester/ Section	III/A	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Convert $(475.25)_8$ to its decimal equivalent & $(549.B4)_{16}$ to its binary equivalent	C201.1	E
2	Convert binary code 11011001 to its Gray equivalent, and Gray code 10110100 to its binary equivalent	C201.1	R
3	State Demorgan's theorem.	C201.1	R
4	Convert the following binary to gray code:1010111000_2.	C201.1	E
5	Perform (11011-100101) using 2's complement.	C201.1	E
6	Draw the NAND-NAND logic for A'B + AB'	C201.2	A
7	Write the POS representation of the following: f(x,y,z) = ∑m(0,1,3,5,7).	C201.2	U,A
8	Draw the NOR-NOR logic for (A+B') (B+C)	C201.2	U,A
9	Simplify the expression $Z= AB + \overline{A}B.(\overline{\overline{A}.C})$.	C201.2	U,A
10	Convert the given expression in canonical SOP form Y= AC+AB+BC.	C201.2	U,A

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11 a	Perform the following addition using BCD and Excess-3 addition (205+569).	C201.1	E
11 b	Encode the binary word 1011 into seven bit odd parity hamming code.	C201.1	E
	Or		
12	A 12 bit Hamming code word is read from memory. What was the original 8 bit data word that was written into memory if the 12 bit word read out is as (1)101110010100 (2)111111110100	C201.1	E
13	Simplify the following function using Karnaugh map. f(A,B,C,D,E)=∑m(0,1,3,9,10,12,13,14,18,24,27,29)+∑d(2,5,6,11,31)	C201.2	U,A
	Or		
14 a	Reduce the following function using K-map. f(A,B,C,D)=ΠM(0,2,3,8,9,12,13,15)	C201.2	A
14 b	Simplify the following function using Karnaugh map. f(w,x,y,z)=∑m(0,1,3,9,10,12,13,14)+∑d(2,5,6,11)	C201.2	A

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Design a 4 bit excess 3 code to BCD converter and implement using logical gates.	C201.2	AZ
	Or		
16	Design a 4 bit BCD code to Gray code converter and implement using logical gates.	C201.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff Incharge: Dr.S. Vijayalakshmi / Asso. Prof / EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/Session	11.10.2021/FN	Marks	50
Course code	ME8792	Course Title	POWER PLANT ENGINEERING			
Batch No.		Duration	90 mins	Academic Year		2021-2022
Year/	II	Semester/Section	III / A&B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Differentiate water tube boilers from fire tube boilers.	C206.1	AZ
2	Is a coal based thermal power plant suitable for fluctuating loads? Why?	C206.1	AZ
3	What is a binary cycle?	C206.1	U
4	What do you understand by supercritical boilers? Mention their types.	C206.1	U
5	What is the application of economizer in a coal based thermal power plant?	C206.1	S
6	Define heat rate.	C206.1	U
7	What is the power input expression for ID fan?	C206.1	R
8	What are the different processes involved in Diesel cycle?	C206.2	R
9	Draw the T-s and p-v diagram for Otto cycle.	C206.2	A
10	Define pressure ratio.	C206.2	R

Part – B

(Answer all the questions 2 x 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Explain the different draught systems as applied to a coal based thermal power plant.	C206.1	A
	or		
12	What is cogeneration power plant? Explain different cogeneration power plants with necessary diagrams.	C206.1	U
13	Draw and explain the working of FBC boilers.	C206.1	A
	or		
14	Explain various methods of cooling the coolant used in coal based thermal power plants.	C206.1	U

Part – C

(Answer all the questions 1 x 10 = 10 marks)

Q. No.	Questions	CO	Skills
15	Along with T-s and p-v diagram explain the various processes involved in Otto cycle and obtain the efficiency.	C206.2	U
	Or		
16	Along with T-s and p-v diagram explain the various processes involved in Diesel cycle	C206.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	11.10.2021	Marks	50
Course code	OMD 551	Course Title	BASICS OF BIOMEDICAL INSTRMENTATION			
Batch No.		Duration	90 mins	Academic Year		2021 - 2022
Year/	III	Sem. / Sec.	V/A & B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define action potential	C306.1	R
2	Explain sodium potassium pump.	C306.1	A
3	Justify the need for electrode for measuring biopotential.	C306.1	A
4	Classify the different types of electrodes.	C306.1	R
5	Define electrode half-cell potential.	C306.1	AZ
6	What is meant by propagation velocity?	C306.1	A
7	Mention the frequency ranges of ECG and EEG	C306.2	R
8	Draw a typical ECG waveform.	C306.2	U
9	What are the different types ECG lead configuration?	C306.2	R
10	What is the purpose of electrode paste?	C306.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Draw the action potential waveform and explain the origin of biopotential.	C306.1	R
	or		
12	Examine the equivalent circuit of microelectrode and explain its electrical nature.	C306.1	AZ
13	Explain the different types of skin surface electrodes	C306.1	R
	or		
14	Explain the biosignal types and their characteristics	C306.1	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Draw the recording set-up for ECG measurement and explain the blocks	C306.2	U
	Or		
16	Draw and explain the different lead configurations and its significance in ECG.	C306.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Staff: Mr.B.Paranthagan & Mr.R.Venugopal

Saranathan College of Engineering

Tiruchirapalli

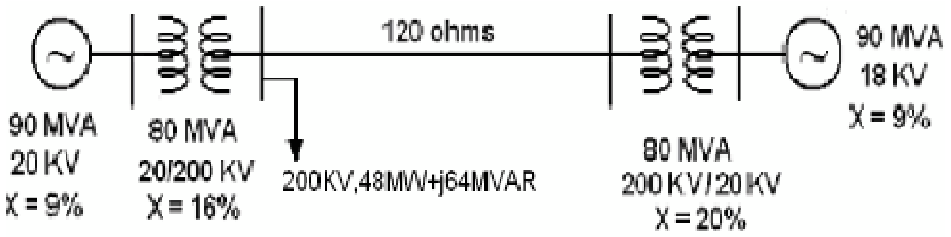
Internal Assessment Test - I			Date/ Session	4.10.21	Marks	50
Course code	EE8501	Course Title	Power System Analysis			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year/	III	Semester/ Section	V / A&B	Department	EEE	

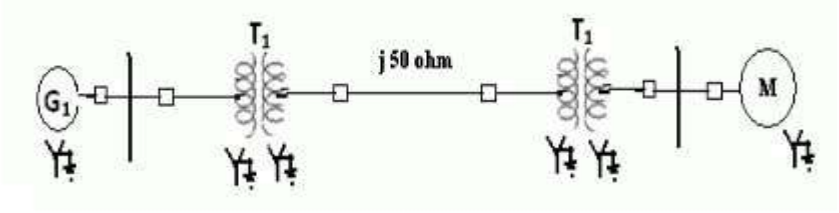
Part – A

(Answer all the questions 10 x 2 = 20marks)

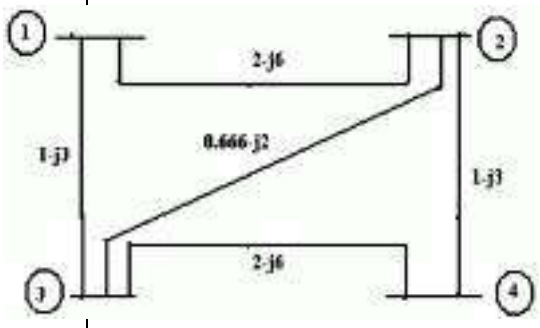
Q. No.	Questions	CO	Skills
1	A Y-connected generator rated at 300MVA, 33kV, has a reactance of 1.24 p.u. Find the ohmic value of the reactance	C301.1	A
2	Mention the advantages of per unit system.	C301.1	U
3	What is the need of base value?	C301.1	U
4	Mention the approximations made in the reactance diagram.	C301.1	U
5	What is single line diagram?	C301.1	A
6	What is off nominal ratio? Draw the equivalent circuit of the transformer with off nominal transformer ratio connected to a transmission line.	C301.1	A
7	Classify the types of buses based on the specified quantities and the quantities to be obtained from the load flow equations.	C301.2	R
8	What is the need of slack bus?	C301.2	U
9	Write the expression for the injected power to a bus.	C301.2	R
10	Mention the merits and demerits of Gauss-Seidel load flow solution.	C301.2	U

Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11a	Draw the p.u impedance diagram for the system shown in figure. Choose Base MVA as 100 MVA and Base KV as 20KV. 	C301.1	AZ
	OR		
12	Examine the reactance diagram for the power system shown in fig. Neglect resistance and use a base of 100MVA , 220kV in 50KΩ line. The ratings of the generator motor and transformer are give below. Generator: 40MVA, 25KV, X'' =20%. Synchronous Motor: 50MVA, 11KV, X''=30% T1: Y-Y transformer : 40MVA 33/220KV, X=15% T2: Y-Y transformer : 30 MVA 11/220KV, X=15%	C301.1	AZ

			
13	For the power system network with the following data, compute the bus admittance matrix using inspection method. Also find the new admittance matrix by eliminating the bus 4. **Bus Code** | **p.u line impedance** | **Half Line Charging admittance in p.u.** 1-2 | 0.05+j0.12 | j0.025 2-3 | 0.06+j0.4 | - 3-4 | 0.75+j0.25 | j0.02 1-3 | 0.045+j0.45 | j0.015 1-4 | 0.015+j0.05 | -	C301.1	AZ
	OR		
14	Form Y_{BUS} using singular transformation method for the following data. Take node 1 as reference node. **Bus Code** | **Bus-Code** | **Self Impedance in p.u** 1 | 1-2(1) | 0.6 2 | 1-3 | 0.5 3 | 3-4 | 0.5 4 | 1-2(2) | 0.4 5 | 2-4 | 0.2	C301.1	AZ

Part – C Answer all the questions

Q. No.	Questions	CO	Skill
15	For the sample system shown in the fig. the generators are connected at all four buses while the loads are at buses 2 and 3. Assuming a flat voltage start, examine bus voltages and bus angles at the end of first Gauss seidal iterations and consider the reactive power limitas $0.2 \leq Q2 \leq 1$	C301.2	UR
			

Bus	P in pu	Q in pu	V in pu	Remarks
1	-	-	$1.04\angle 0^0$	Slack bus
2	0.5	-	1.04pu	PV bus
3	-1.0	0.5	-	PQ bus
4	0.3	-0.1	-	PQ bus

	OR		
16	With a net flowchart , load flow algorithm explain the computational procedure for load flow solution using Gauss-Seidal method.	C301.2	UR

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Staff In Charge: Dr.M.V.Suganyadevi,ASP/EEE, Dr.K.Rajkumar, ASP/EEE

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test – I			Date/Session	5.10.2021	Marks	50
Course code	EE8551	Course Title	Microprocessor & Microcontroller			
Batch No.		Duration	1 ½ hours	Academic Year	2021-2022/ODD	
Year	III	Semester	05	Department	EEE	

Part – A (20 Marks)

I. Choose the correct Answer for the following Questions **(10x1=10 Marks)**

Q. No.	Questions	CO	Skills
1.	List out flags available in 8085 processor.	C302.1	A
2.	Mention the use of ALE in 8085 Microprocessor	C302.1	U
3.	State any four pins of 8085 Microprocessor which are used to generate control and status signals.	C302.1	U
4.	Define Machine cycle.	C302.1	U
5.	Define address bus and Data bus.	C302.1	R
6.	Define CALL instruction in 8085 processor.	C302.2	U
7.	Give examples for one byte, two byte and three byte instructions.	C302.2	U
8.	Explain the operation of MOV B, C & MVI B,05	C302.2	U
9.	Differentiate MVI, and MOV instruction.	C302.2	U
10.	Explain one Rotate instruction with an example.	C302.2	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Draw and explain the architecture of 8085 processor.	C302.1	AZ
	Or		
12	Briefly explain about the interrupts available in 8085.	C302.1	AZ
13	Briefly explain about the Pin out details of 8085.	C302.2	AZ
	Or		
14	Draw the timing diagram for the instruction IN 3C	C302.2	AZ

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Explain the various addressing modes in 8085 with suitable examples.	C302.2	AZ
	Or		
16	Explain any 10 data transfer instructions in 8085 with suitable example.	C302.2	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.M.Marimuthu & Dr.S.Vijayalakshmi

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	6-10-2021/ FN	Marks	50
Course code	EE8552	Course Title	Power Electronics			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year/	III	Semester/ Section	V / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skils
1	Classify the types of diodes and What is softness factor of diodes?	C303.1	A
2	Define Latching current and Holding current.	C303.1	A
3	Mention the advantages of 'RC' triggering over 'r' triggering.	C303.1	U
4	Define the following terms: a. firing angle b. conduction angle c. extinction angle	C303.2	A
5	Define "turn off time" of SCR.	C303.1	U
6	What is meant by Phase control?	C303.2	U
7	Define input power factor for converters.	C303.2	U
8	What is meant by commutation of SCR and List it types?	C303.2	U
9	Why power factor of semi converter is better than full converter.	C303.2	R
10	What are the roles of freewheeling diodes in a controlled rectifier?	C303.2	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	CO	Skills
1 (a).	Discuss the different modes of operation of thyristor with the help of its static V-I characteristics.	C303.1	U
1 (b).	Discuss the dynamic characteristics of a thyristor during its turn –ON and turn-OFF process.	C303.1	U
	or		
2.	Describe the UJT triggering circuit with neat sketch.	C303.1	R&U
3.	Examine the circuit and output wave form, working of single phase two pulse fully controlled converter with RL load in discontinuous current mode of operation.	C303.2	R&U
	or		
4.	Explain the working of single phase two-pulse converter which has inherent freewheeling action operating in RL load and derive the formula for average output voltage and current.	C303.2	R&U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	CO	Skills
5.	Derive an expression for harmonic factor, displacement factor and power factor of a single phase full converter with large inductive load from the fundamental principle.	C303.2	U, AZ
	or		
6.	Describe the any three methods of turn-on mechanism of SCR.	C303.2	U, AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge: Mr.R.Balasubramanian, ASP/EEE, *Mr.S.Ramprasath*, A.P./EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - I			Date/ Session	08.10.2021/ FN	Marks	50
Course code	EE8591	**Course Title**	Digital Signal Processing			
Batch No.		**Duration**	90 mins	**Academic Year**	2021-2022	
Year	III	**Semester/ Section**	V/A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Differentiate Power and Energy Signals.	C304.1	U
2	Find the Nyquist rate for the signal x(t) = 2cos300π t.	C304.1	A
3	Sketch x[n] = {**2,**1,3,0,2} and find x[n - 4].	C304.1	A
4	What are the different types of representation of discrete time signal?	C304.1	R
5	Find ODD and EVEN signals for x(n) = {1,2,1,0,1}	C304.1	A
6	Write the properties of Region of Convergence.	C304.2	R
7	Find the system transfer function H(z) if y(n) = x(n)+y(n-1).	C304.2	A
8	Find the Z-transform for the sequence $x(n) = a^n.u(n)$	C304.2	A
9	State initial value theorem & final value theorem of Z Transform	C304.2	R
10	List the methods to find inverse Z-Transform.	C304.2	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Test whether the following systems are linear, causal, time-invariant and memory-less (i) y(n) = nx(n)+[x(n+1)] (ii) y(n) = x(2n) (5+5)	C304.1	AZ
	or		
12	Determine the energy and power of the following signals. (i) $x(n) = (0.5)^n u(n)$ (ii) x[n]=nu[n] (5+5)	C304.1	AZ
13	(i) Find the convolution of two sequences x(n) = {1,2,-1,1} and h(n) = {1,0,1,1} (7) (ii) Write the linearity property of Z-transform (3)	C304.2	AZ
	or		
14	(i) Determine the Z-transform of the signal $x(n) = \sin(\omega_0 n)\, u(n)$ (7) (ii) Write the differentiation property of Z-transform (3)	C304.2	AZ
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	Obtain the inverse Z-transform of $X(Z) = Z^2 / Z^2+1.5Z+0.5$ for ROC $\|z\| > 1$ (ii) $\|z\| < 0.5$ (iii) $0.5 < \|z\| < 1$ using any two methods. (5+5)	C304.2	AZ
	or		
16	(i) Find the impulse response of the discrete time system described by the difference equation $y(n-2) - 3y(n-1) + 2y(n) = x(n-1)$ (5) (ii) Find the stability of the given system y(n)-3y(n-1)-4y(n-2) = x(n)+2x(n-1) (5)	C304.2	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill needs to be mentioned against each question

Name of the faculty: Dr.P.Ram Prakash, AP/EEE, Mr.R.Sridhar, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Model Exam			Date/ Session	24-12-21 / FN	Marks	100
Course code	EE8552	Course Title	Power Electronics			
Batch No.		Duration	3 hours	Academic Year	2021	
Year/	III	Semester/ Section	V / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20 marks)

Q. No.	Questions	Skills
1	What is a Matrix converter?	U
2	Enumerate some of the industrial applications of cyclo-converter	R
3	What is meant by resonant converter?	U
4	What is integral cycle control?	U
5	Define duty cycle in DC chopper.	A
6	What is meant by current limit control of a chopper?	A
7	Explain the term sequence control of ac voltage regulators.	R
8	A step up chopper is operated with a duty cycle of 0.6 for a dc input of 100V. Determine the output voltage for a load = 5 ohm.	AZ
9	What is meant by space vector modulation?	A
10	What type of gating signal is used in single phase ac voltage controller with RL load?	A

Part – B

(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	Skills
11(a)	i. Explain the operation of step up chopper and derive the expression for its output voltage. ii. A type A chopper has supply voltage Vs = 220 and duty cycle of 0.4 and 0.6. For these duty cycle, calculate (a) Average and RMS voltage of output voltage (b) Output power for R load of 10 ohm.	R
	or	
11(b)	Describe with neat diagram the principle and working of Buck-Boost converter.	R
12(a)	Draw the static characteristics of (i) SCR (ii) TRIAC and explain its operating region.	U
	or	
12(b)	Draw the static characteristics of (i) MOSFET (ii) IGBT and explain its operating region.	U
13(a)	Draw the circuit diagram of three phase to single phase cycloconverter and explain its operation with waveforms	R
	or	
13(b)	Explain the operation of two stage sequence control of AC voltage controller.	R
14(a)	Explain in detail about the ON/OFF control applicable to single phase ac voltage and derive the expression for RMS output voltage.	U
	or	
14(b)	Describe the working of single phase AC voltage controller for resistive load with suitable power circuit and output waveform. Derive the expression for RMS and power factor.	U

15(a)	Describe the basic principle of single phase step down bridge type cycloconverter feeding RL load. Assume continuous conduction and draw the current and load voltage waveform and mark the conduction of various thyristors.	R
	or	
15(b)	Explain the operation of the single phase step down midpoint configuration cycloconverter feeding R load with necessary waveforms.	

Part – C

(Answer all the questions 1 x 15 = 15 marks)

Q. No.	Questions	Skills
16(a)	The buck regulator has an input voltage of Vs = 15V. The regulated average output voltage is Vo = 5V at R = 500 ohm and peak to peak output ripple voltage is 20mV. The switching frequency is 25KHz if the peak to peak ripple current of inductor if limited to 0.8A, Determine: (i) The duty cycle d (ii) The filter Inductance L (iii) The filter capacitance C	**AZ**
	or	
16(b)	A single phase AC Voltage controller has a Resistive load of R = 10 ohm and input voltage Vs = 120 V, 50Hz the delay angle of SCR T1 is 60^{o}. Determine the rms value of the output voltage Vo and the input power factor	**AZ**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Incharge: Mr..R.Balasubramanian & S.RamPrasath

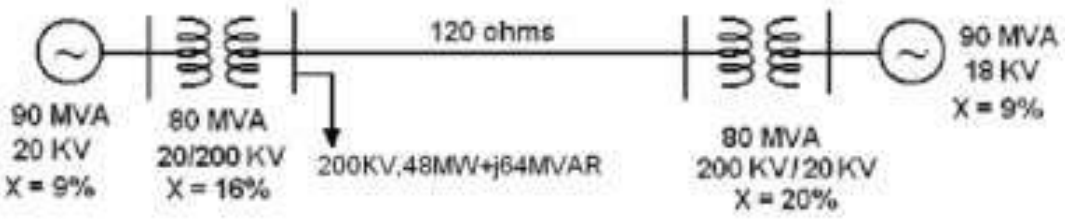
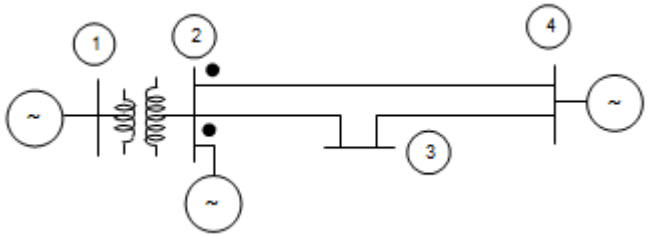
Saranathan College of Engineering
Tiruchirapalli

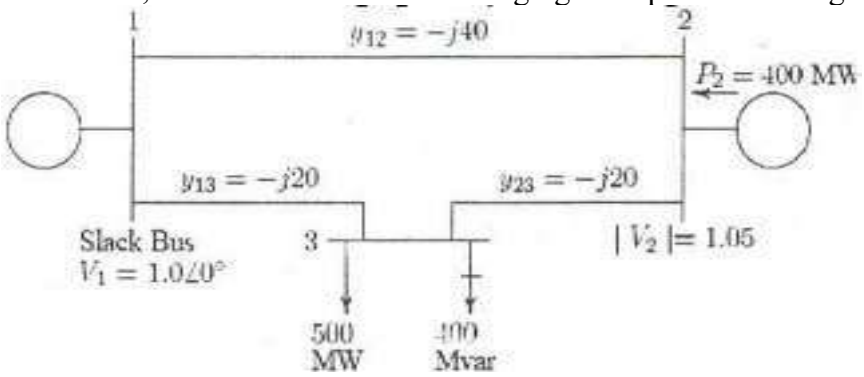
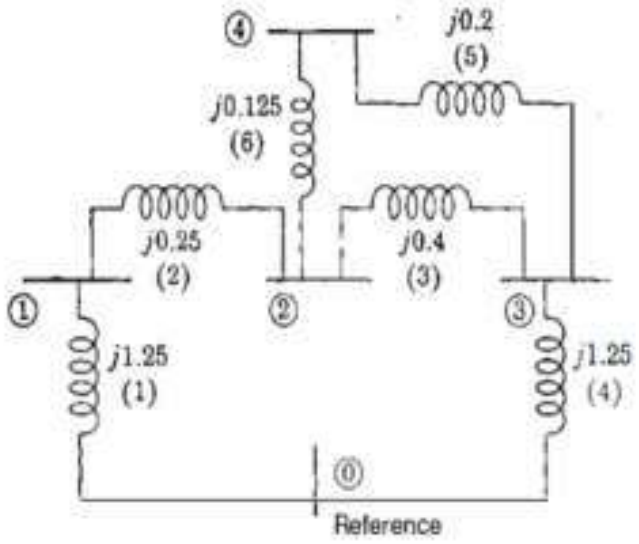
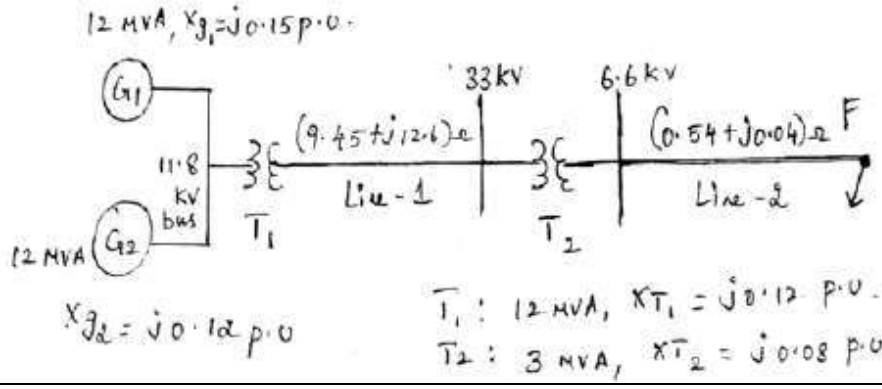
Model Exam			Date/Session	20.12.2021	Marks	100
Course code	EE8501	**Course Title**	POWER SYSTEM ANALYSIS			
Batch No.		**Duration**	180 mins	**Academic Year**	2021 - 2022	
Year/	III	**Semester/Section**	V/A&B	**Department**	EEE	

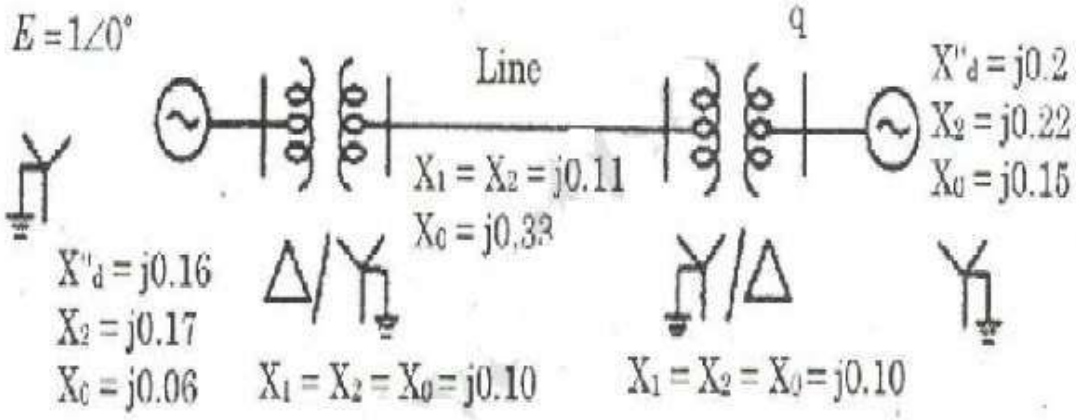
Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What is the need of base values?	C301.1	R
2.	Give the equation for transforming base kV on LV side to HV side of a transformer and vice versa.	C301.1	E
3.	What do you mean by a flat voltage start?	C301.2	C
4.	Discuss the effect of acceleration factor in the load flow solution algorithm	C301.2	AZ
5.	How symmetrical faults are analyzed?	C301.3	AZ
6.	Examine the order of severity and symmetrical fault?	C301.3	AZ
7.	Discover the symmetrical components Va1, Va2 and Va0 in terms of unbalanced vectors Va, Vb and Vc.	C301.4	AZ
8.	Define short circuit capacity	C301.4	R
9.	Classify steady state stability limit. Define them	C301.5	U
10.	Define swing curve. What is the use of swing curve?	C301.5	R

Part – B
(Answer all the questions 5 x 13= 65marks)

Q. No.	Questions	CO	Skills
11.a	Draw the pu impedance diagram for the system shown in figure. Choose Base MVA as 100 MVA and Base KV as 20 KV. 	C301.1	A
	(Or)		
11.b	Consider the power network shown in Fig. 1.16. The ground bus is marked as 0. Grounding impedances at buses 1, 2, and4are j0.6 Ω, j0.4 Ω and j0.5 Ω respectively. Impedances of the elements 3-4, 2-3, 1-2 and 2-4 are j0.25 Ω, j0.2 Ω, j0.2 Ω and j0.5 Ω. The mutual impedance between elements 2-3 and 2-4 is j0.1 Ω. Obtain the bus admittance matrix of the power network. 	C301.1	U
12.a	Figure shows the one line diagram of a simple three bus power system with generation at buses at 1 and 2.the voltage at bus 1 is V=1+j0.0 V per unit. Voltage magnitude at bus 2 is fixed at 1.05 p.u. with a real power generation of 400 MW. A Load consisting of 500MW and 400 MVAR base. For the purpose of hand	C301.2	U

	calculation, line resistance and line charging susceptances are neglected  Using Newton-Raphson method, start with the initial estimates of V2 0 =1.05+j0.0 and V3 0 =1.05+j0.0, and keeping $\lvert V2 \rvert$ =1.05 p.u., examine the phasor values v2 and v3.perform two iterations		
	(Or)		
12.b	Derive N-R method of load flow algorithm and explain the implementation of this algorithm with the flowchart.	C301.2	R
13.a	Find the bus impedance matrix using bus building algorithm for the given network.  	C301.3	AZ
	(Or)		
13.b	For the radial network shown in figure 3 phase fault occurs at point F. Determine the fault current and the line voltage at 11.8 kV bus under fault condition  	C301.3	E
14.a	Calculate the sub transient current in each phase for a dead short circuit on the one phase to ground at bus ‘q’ for the system shown in figure below.	C301.4	E

			
(Or)			
14.b	Discuss the expression for fault current in single line to ground fault on unloaded generator. Draw an equivalent network showing the inter connection of networks to simulate single line to ground fault	C301.4	R
15.a	Derive the swing equation for a single machine connected to infinite bus system. State the assumptions if any and state the usefulness of this equation. Neglect the damping	C301.5	AZ
(Or)			
15.b	Write a short note on i. Factors influencing transient stability, ii. Voltage collapse	C301.5	U

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	Explain the term critical clearing angle and critical clearing time in connection with the transient stability of a power system	C301.5	R
16.b	Describe the equal area criterion for transient stability analysis of a system	C301.5	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Staff In Charge: Dr.M.V.Suganyadevi,ASP/EEE. Dr.K.Rajkumar, ASP/EEE

SARANATHAN COLLEGE OF ENGINEERING

Panjappur, Tiruchirapalli – 620 012

Internal Assessment Test - II			Date/ Session	28.10.2021	Marks	50
Course code	EE8501	Course Title	Power System Analysis			
Batch No.		Duration	90 Mins	Academic Year		2021-2022
Year/	III	Semester/ Section	V / A&B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

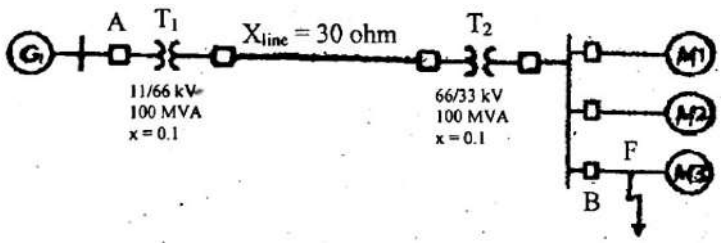
Q. No.	Questions	CO	Skills
1	What is slack bus?	C301.2	U,R
2	Write the quantities that are associated with each bus in a system.	C301.2	U
3	Compare Gauss-Seidel and Newton Raphson methods.	C301.2	U
4	When the generator bus is treated as load bus in NR load flow study? What will be the reactive power and bus voltage when the generator bus is treated as load bus?	C301.2	U
5	What is meant by fault level?	C301.3	R
6	The Z-bus method is very suitable for fault studies on large systems rather than Y- bus. Why?	C301.3	U
7	List the symmetrical and unsymmetrical faults that occur in a power system.	C301.3	R
8	What is the significance of subtransient reactance and transient reactance in short circuit studies?	C301.3	U
9	For a fault at a given location, rank the various faults in the order of severity.	C301.3	U
10	Define short circuit MVA.	C301.3	R

Part – B (Answer all the questions 2 x 10 = 20marks)

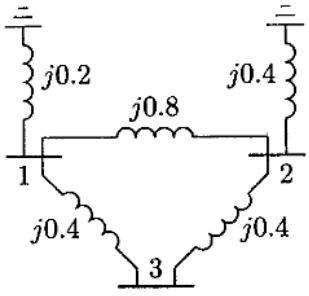
Q. No.	Questions	CO	Skills
11.a	Consider the power system with the following data: $$Y_{BUS} = \begin{pmatrix} -j12 & j8 & j4 \\ j8 & -j12 & j4 \\ j4 & j4 & -j8 \end{pmatrix}$$	C301.2	AZ, E

Bus	Type	Generation		Load		Bus Voltages	
		P_G	Q_G	P_L	Q_L	V	δ
1	Slack	?	?	0	0	1.02	0
2	PQ	25	15	50	25	?	?
3	PV	0	0	60	30	?	?

Assume that the bus 2 can supply any amount of reactive power. With a flat start, perform the first iteration of power flow analysis using Newton-Raphson method.

	OR		
11.b	With a neat flow chart, explain the computational procedure for load flow solution using Newton Raphson iterative method when the system contains all types of buses.	C301.2	AZ, C
12.a	A 100 MVA, 11 kV generator with X"=0.20 p.u is connected through a transformer and a line to a bus bar that supplies three identical motors as shown in Fig and each motor has X"=0.20 p.u and X'=0.25 p.u on a base of 20 MVA, 33 kV, the bus voltage at the motors is 33 kV when three phase balanced fault occurs at a point F. Calculate (i) Subtransient current in the fault, (ii) Subtransient current in the circuit breaker B, (iii) Momentary current in the circuit breaker B, (iv) The current to be interrupted by the circuit breaker B in 5 cycles.  Figure 1	C301.3	AZ, E
	OR		
12.b	With the help of a detailed algorithm, explain how a symmetrical fault can be analyzed using Z_{bus}.	C301.3	AZ

Part – C Answer all the questions

Q. No.	Questions	CO	Skills
13.a	Deduce the Z bus building algorithm. Illustrate the step by step procedure of Z-bus formulation.	C301.3	AZ, C
	OR		
13.b	Construct Z bus for the given network shown in Figure 2.  Figure 2	C301.3	AZ, E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff In Charge: Dr.M.V.Suganyadevi,ASP/EEE, Dr.K.Rajkumar, ASP/EEE

Saranathan College of Engineering

Tiruchirapalli

UNIT test I			Date/ Session	6-12-2021/ AN	Marks	50
Course code	EE8552	**Course Title**	Power Electronics			
Batch No.		**Duration**	90 mins	**Academic Year**	2021 - 2022	
Year/	III	**Semester/ Section**	V / A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	Skils
1	Define Latching current and Holding current	A
2	What is softness factor of diodes?	A
3	Define Turn on and Turn off time of SCR.	U
4	What is the turn-off time for converter grade SCRs and inverter grade SCRs?	A
5	Define the following terms: a. firing angle b. conduction angle c. extinction angle	U
6	Define Total Harmonics Distortion (THD)	U
7	Why thyristor are not preferred for inverters?	U
8	Differentiate VSI from CSI.	U
9	What is meant by PWM control?	R
10	List out the performance parameters of inverters?	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	Skills
1	What are the different methods for turning off an SCR? Explain all methods in detail.	U
	or	
2.	Briefly discuss the UJT triggering circuit of SCR.	R&U
3.	Describe the operation of a single phase two pulse bridge converter with RL load for continuous and discontinuous conduction mode using relevant wave forms. Obtain the expression for average and RMS output voltage.	R&U
	or	
4.	Explain the effect of source impedance on the performance of single phase full converters.	R&U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	Skills
5.	Explain three-phase 180^0 conduction mode of inverter.	U
	or	
6.	Describe in detail, the various types of PWM methods available for voltage control employed in an inverter. (Any two)	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge:
Mr.R.Balasubramanian. Assoc.P / EEE
Mr.S.Ramprasath, A.P./EEE

Saranathan College of Engineering

Tiruchirapalli

Model Theory Examination				Date/Session	22.12.21/AN	Marks	100
Course code	EE8591	Course Title	DIGITAL SIGNAL PROCESSING				
Batch No.		Duration	180 mins	Academic Year	2021 - 2022		
Year/	III	Semester/Section	V/A&B	Department	EEE		

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define deterministic and random signals.	C304.1	U
2.	Sketch x[n] = { 2,1,3,0,2} and find x[n+2],x[n-4].	C304.1	R
3.	State the time reversal property of the z-transform.	C304.2	R
4.	Determine the range of values of the parameter 'a' for which the linear time invariant system with impulse response $h(n)=a^n u(n)$ is stable.	C304.2	U
5.	Find the DFT of the sequence x(n)={1,1,0,0}.	C304.3	A
6.	Determine the convolution sum of two sequences x(n) = {3,2,1,2} and h(n) = {1,2,1, 2}.	C304.4	U
7.	Obtain the Direct Form-I realization of the given difference equation y(n)=0.5y(n-1)-0.25y(n-2)+x(n)+0.4x(n-1).	C304.4	A
8.	Define warping effect.	C304.5	R
9.	What are the stages in pipelining process?	C304.6	U
10.	List the features of digital signal processor and list the advantages of VLIW architecture.	C304.6	R

Part – B

(Answer all the questions 5 x 13= 65marks)

Q. No.	Questions	CO	Skills
11.a	(i) Show that the power of a signal is equal to the sum of powers of its even and odd components (5) (ii) Prove the system is time invariant and stable, $y(n) = x(n^2)$ if $x(n) = 1$, $0 \le n \le 3$. Illustrate y(n) and y(n-2), compare the results. (8)	C304.1	AZ
	(Or)		
11.b	(i) Consider two signals x_1 and x_2 and determine the procedure to prove the system to be (i) Linear (ii) Stable and (iii) Time invariant systems. (5) ii) What is meant by quantization and quantization error? A signal x(t) = sin c(50 πt) is sampled at a rate of (i) 20 Hz (ii) 50 Hz and (iii) 75 Hz. For each of these cases, explain if you can recover the signal x(t) from the sampled signal x(n). (8)	C304.1	AZ
12.a	(i) Determine the z-transform of the following signals, $x(n) = n(-1)^n u(n)$ and $x(n) = -n.a^n u(-n-1)$ (8) (ii) Find the impulse response of the discrete time system described by the difference equation $y(n-2) - 3y(n-1) + 2y(n) = x(n-1)$ (5)	C304.2	AZ
	(Or)		
12.b	(i) Find the Z-Transform and ROC of $x(n) = r^n \cos(n\theta)\, u(n)$ (7) (ii) State and prove Convolution and Parseval's Theorem using Z-Transform (6)	C304.2	AZ
13.a	Determine the DFT of the given sequence x(n)={1,-1,-1,-1,1,1,1,-1} using DIT-FFT Algorithm	C304.3	AZ
	(Or)		
13.b	Find the IDFT of the sequence X(k)={4, 1-j2.414, 0, 1-j0.414, 0, 1+j0.414, 0, 1+j2.414}	C301.3	AZ

14.a	Obtain an analog Chebyshev filter transfer function that satisfies the given constraints $0.707 \leq \|H(j\Omega)\| \leq 1$; $0 \leq \Omega \leq 2$ and $\|H(j\Omega)\| \leq 0.1$; $\Omega \geq 4$	C301.4	AZ
	(Or)		
14.b	Design a filter using Hamming Window with specification N=7 of the system $H_d(e^{j\omega})=e^{-j3\omega}$ for $-\Pi/4 \leq \omega \leq \Pi$, otherwise zero	C301.4	AZ
15.a	Discuss the features and architecture of TMS 320C50 processor.	C301.6	AZ
	(Or)		
15.b	Explain the following (i) MAC unit of DSP (ii) Pipelining structure of DSP	C301.6	AZ

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	Design a Butterworth filter using impulse invariance method for the following specifications $0.8 \leq \|H(e^{j\omega})\| \leq 1$ for $0 \leq \omega \leq 0.2\Pi$ $\|H(e^{j\omega})\| \leq 0.2$ for $0.6\Pi \leq \omega \leq \Pi$	C301.5	AZ
	(Or)		
16.b	(i) A difference equation describing a filter given by, $y(n) - 2y(n-1) + y(n-2) = x(n) + 0.5\,x(n-1)$ obtain cascaded structure. (7) (ii) Detrmine the transfer function of the Butterworth filter for α_P = 3dB, α_S = 16dB, f_P = 1kHz and f_S = 2 kHz. (8)	C301.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Dr.P.Ram Prakash, AP/EEE, Mr.R.Sridhar, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III			Date/ Session	26.11.2021/ FN	Marks	50
Course code	EE8591	**Course Title**	Digital Signal Processing			
Batch No.		**Duration**	1.5 hrs	**Academic Year**	2021 - 2022	
Year	III	**Semester/ Section**	V/A & B	**Department**	EEE	

Part – A

(Answer all the questions 10 × 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write the condition on the FIR sequence h(n) is to be imposed as a liner phase filter?	C304.4	U
2	Write a note on pre-warping method.	C304.4	U
3	Distinguish IIR and FIR Filter.	C304.4	U
4	Obtain the Direct Form-I realization of the given difference equation y(n)=0.5y(n-1)-0.25y(n-2)+x(n)+0.4x(n-1).	C304.4	U
5	Justify the usage of Hamming window in FIR filter against rectangular window.	C304.5	A
6	Define Gibbs phenomenon.	C304.5	R
7	What are the stages in pipelining process?	C304.6	U
8	List the features of digital signal processor.	C304.6	U
9	List the advantages of VLIW Architecture	C304.6	U
10	List the on chip peripherals in C5x.	C304.6	R

Part – B

(Answer all the questions 2 × 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Design a filter using Fourier series method for N=9 of Band Reject Filter. $H_d(e^{j\omega}) = \begin{cases} 1 \; for \; \lvert\omega\rvert \le \frac{\pi}{6} \\ 0 \; for \; \frac{\pi}{6} \le \lvert\omega\rvert \le \frac{\pi}{3} \\ 1 \; for \; \lvert\omega\rvert \ge \frac{\pi}{3} \end{cases}$	C304.4	AZ
	Or		
12	Design a Chebyshev digital filter for the following specifications $0.8 \le \lvert H(e^{j\omega})\rvert \le 1$ for $0 \le \omega \le 0.2\pi$ and $\lvert H(e^{j\omega})\rvert \le 0.2$ for $\omega \ge 0.6\pi$ using Bilinear technique with T = 1 sec	C304.4	AZ
13	Explain various types of addressing modes of Digital signal Processors with suitable examples	C304.6	AZ
	Or		
14	Discuss the features and architecture of TMS 320C50 processor.	C304.6	AZ
	Part – C **(Answer all the questions 1 × 10 = 10 marks)**		
15	Design a filter using Hamming Window with N = 7 of the system, $H_d(e^{j\omega}) = \begin{cases} e^{j3\omega}, \; \frac{-\pi}{4} \le \omega \le \frac{\pi}{4} \\ 0, otherwise \end{cases}$	C304.5	AZ
	or		
16	(i) A difference equation describing a filter given by, y(n) – 2y (n-1) + y (n-2) = x(n) + 0.5 x (n-1) obtain Direct Form-I structure. (5) (i) Determine the transfer function of the Butterworth filter for α_P = 3dB, α_S = 16dB, f_P = 1kHz and f_S = 2 kHz. (5)	C304.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Dr.P.Ram Prakash, AP/EEE, Mr.R. Sridhar, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Unit Test			Date/ Session	15.12.2021/AN	Marks	50
Course code	EE8591	Course Title	Digital Signal Processing			
Batch No.		Duration	90 Mins.	Academic Year	2021 - 2022	
Year	III	Semester/ Section	V/A & B	Department	EEE	

Part – A

(Answer all the questions 10 × 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define aliasing effect.	C304.1	U
2	What do you mean by Nyquist rate and Nyquist interval?	C304.1	R
3	What is symmetric and Anti symmetric signals?	C304.1	R
4	Write the equation of power and energy of a CT signal.	C304.1	R
5	What is zero padding?	C304.4	U
6	State the time shifting property of DTFT.	C304.4	R
7	Draw the basic butterfly diagram for DIT algorithm.	C304.4	U
8	Draw the frequency response of the Chebyshev type 1 and type II filter.	C304.5	R
9	Define prewarping.	C304.5	U
10	Mention the properties of bilinear transformation	C304.5	R

Part – B

(Answer all the questions 2 × 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Check whether the given signal is stable, linear, shift variant, causal and static y(n)=sgn[x(n)]	C304.1	AZ
	Or		
12	State and prove the sampling theorem.	C304.1	R
13	Compute the 8 point DFT of the sequence $x(n)=\begin{cases}1, & 0 \le n \le 7\\ 0, & \text{otherwise}\end{cases}$ using DIT and DIF algorithm.	C304.3	AZ
	Or		
14	Given the sequences $x_1(n)=\{1,2,3,1\}$ and $x_x(n)=\{4,3,2,2\}$. Find $x_3(n)$ such that $X_3(k) = X_1(k)\, X_2(k)$ using DFT and IDFT formula.	C304.3	A
	Part – C **(Answer all the questions 1 × 10 = 10 marks)**		
15	Obtain the direct form I, direct form II, cascade and parallel form realization for the following system. Y(n)=-0.1y(n-1)+0.2y(n-2)+3x(n)+3.6x(n-1)+0.6x(n-2)	C304.4	A
	Or		
16	Design a Chebyshev digital filter for the following specifications $0.8 \le \lvert H(e^{j\omega})\rvert \le 1$ for $0 \le \omega \le 0.2\pi$ and $\lvert H(e^{j\omega})\rvert \le 0.2$ for $\omega \ge 0.6\pi$ using Bilinear technique with T = 1 sec	C304.4	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Dr.P.Ram Prakash, AP/EEE, Mr.R. Sridhar, AP/EEE.

Saranathan College of Engineering

Tiruchirappalli - 620012

Internal Assessment Test – II			Date/Session	27.10.2021	Marks	50
Course code	EE8551	Course Title	Microprocessor & Microcontroller			
Batch No.		Duration	1 ½ hours	Academic Year	2020-2021/ODD	
Year	III	Semester	05	Department	EEE	

Part – A (10 x 2 = 20 Marks)

II. Answer all the Questions **(5x2=10 Marks)**

Q. No.	Questions	CO	Skills
1	What is the difference between microprocessor and microcontroller?	C302.3	A
2	Discuss the salient features of 8051 family of controllers	C302.3	U
3	What is the size of RAM in 8051?	C302.3	R
4	List the flags of 8051 and give their usage.	C302.3	R
5	List any applications of Microcontroller.	C302.3	A
6	What is the function of DPTR register?	C302.3	R
7	What is the significance of EA line of 8051 microcontroller?	C302.3	R
8	How is memory organized in 8051?	C302.3	R
9	Mention some of the 8051 special function register.	C302.3	R
10	State the function of RS1 and RS0 bits in the flag register of Intel 8051.	C302.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Write an ALP for arranging the block of data stored in the memory locations from 8000 to 8004 numbers in ascending order form.	C302.2	A
	Or		
12	Write an ALP for finding the biggest numbers in a block of data stored in the memory locations from 5000 to 5004, finally stored the biggest number in the location 5010.	C302.2	A
13	Explain about pin details of 8051 microcontroller in detail.	C302.3	R
	Or		
14	Briefly discuss about memory organization of 8051 microcontroller.	C302.3	R

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	Discuss with a neat block diagram of 8051 Microcontroller architecture.	C302.3	R
	Or		
16	Short notes on various addressing modes in 8051 with suitable example.	C302.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.M.Marimuthu & Dr.S.Vijayalakshmi

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	2-11-2021/ FN	Marks	50
Course code	EE8552	Course Title	Power Electronics			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year/	III	Semester/ Section	V / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skils
1	What are the advantages of PWM inverter?	C303.4	A
2	Differentiate VSI and CSI.	C303.4	A
3	What type of inverter require feedback diode?	C303.4	U
4	What are the applications of Inverters?	C303.4	A
5	What are the performance paramters of inverters?	C303.4	U
6	Compare between 120^o and 180^o mode of inverter operation?	C303.4	U
7	List the methods of controlling the output voltage of inverters.	C303.4	U
8	What are the disadvantages of the harmonics present in the inverter system?	C303.4	U
9	Mention some of the applications of controlled rectifier?	C303.2	R
10	What is commutation angle or overlap angle?	C303.2	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	CO	Skills
11	Explain the operation of 3 phase 3 pulse converter with R load with relevant diagrams and derive the average output voltage.	C303.2	U
	or		
12.	With necessary circuit and waveforms, explain the principle of operation of 6- pulse converter with RL load (fully controlled) in CCM. Derive the expression for average output voltage	C303.2	R&U
13.	Explain with waveform of 3 phase inverter for 180 degree mode of conduction	C303.4	R&U
	or		
14.	With the neat circuit and output wave forms, explain the operation of three phase bridge inverter in 120 degree mode of operation	C303.4	R&U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	CO	Skills
15.	Describe the working of a 1 phase full bridge inverter with relevant circuit and waveforms	C303.4	U, AZ
	or		
16.	Explain the principle of operation of single phase dual converter with neat power circuit diagram.	C303.4	U, AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge: M.r.Balasubramanian, Assoc.prof/EEE & Mr.S.Ramprasath, A.P./EEE

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - II			Date/ Session	01.11.2021/FN	Marks	50
Course code	EE8591	Course Title	Digital Signal Processing			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year	III	Semester/ Section	V/A & B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is the relationship between Z-transform and DTFT?	C304.2	U
2	Find the system transfer function H(z) if y(n) = x(n)+y(n-1).	C304.2	U
3	Define system function.	C304.2	R
4	Find the DFT sequence of x(n) = {1,1,0,0}	C304.3	A
5	State and prof the circular frequency shifting property of DFT.	C304.3	A
6	What is zero padding?	C304.3	R
7	Draw the basic butterfly structure of DIT FFT algorithm	C304.3	U
8	What are the applications of FFT algorithms?	C304.3	A
9	Calculate the percentage saving in calculations in a 256 point radix-2 FFT, when compared to direct DFT.	C304.3	A
10	Define twiddle factor and write its magnitude and phase angle.	C304.3	U

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	(i) Obtain the convolution of $x_1(n)$= {0,1, 4,- 2} and $x_2(n)$ ={1, 2, 2,2} (5) (ii) Determine the DTFT of $x(n) = (0.5)^{n-1} u(n-1)$ (5)	C304.2	AZ
	or		
12	(i) Determine the discrete time Fourier transform of $x(n) = a^{\|n\|}$, $\|a\| < 1$ (5) (ii) Obtain the circular convolution of $X_1(n)$= {1,2,2,1} and $X_2(n)$ ={1,2,3,1} (5)	C304.2	AZ
13	Determine the 8 point DFT of the signal x(n) = {1,1,1,1,1,1,0,0}and sketch its magnitude and phase.	C304.3	AZ
	or		
14	Find the IDFT of the sequence X(k)={4, 1-j2.414, 0, 1-j0.414, 0, 1+j0.414, 0, 1+j2.414}	C304.3	AZ
	Part – C **(Answer all the questions 1 x 10 = 10marks)**		
15	An 8-point sequence is given by compute 8 point DFT of x(n)={1,2,3,4,4,3,2,1} is given by Radix-2 DIF-FFT	C304.3	AZ
	or		
16	Find the 8 point DFT of the sequence of x(n) = {1/2, 1/2, 1/2, 1/2, 0,0,0,0} using decimation in time radix-2 FFT algorithm	C304.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Dr.P.Ram Prakash, AP/EEE, Mr.R.Sridhar, AP/EEE.

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test – III			Date/ Session	24-11-21/FN	Marks	50
Course code	OMD 551	Course Title	Basics of Biomedical Engineering			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year	III	Semester/ Section	V /A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define cardiac output.	C306.4	R
2	Define systolic pressure	C306.4	AZ
3	What is the use of blood flow meter?	C306.4	R
4	What is the volume of blood in human body?	C306.5	U
5	Define Blood Pressure	C306.5	U
6	Define pulse rate	C306.5	R
7	What are the blood gases?	C306.6	U
8	What are the different types of blood cells?	C306.6	R
9	Differentiate calorimeter from spectrophotometer	C306.6	A
10	What is the need of blood cell counter?	C306.6	R

Part – B

(Answer all the questions 5 x 13 = 65marks)

Q. No.	Questions	CO	Skills
11.	Discuss in detail the indicator and dye dilution method for cardiac output measurement.	C306.4	U
	Or		
12	Write a detailed note on the blood flow measurement using ultrasound.	C306.4	AZ
13.	Describe in detail with neat diagram, differential ausculatory technique of blood pressure measurement.	C306.5	AZ
	Or		
14.	Write brief note on respiration rate and pulse rate measurement.	C306.5	U

Part – C

(Answer all the questions 1 x 15 = 15marks)

15.	Explain with the help of functional diagram the working of spectrophotometer and colorimeter.	C306.6	A
	Or		
16.	Describe in detail blood gas analyser with neat diagram and also write short notes on non-invasive patient monitoring.	C306.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

SARANATHAN COLLEGE OF ENGINEERING

Panjappur, Tiruchirapalli – 620 012

Internal Assessment Test - III			Date/ Session	23.11.2021	Marks	50
Course code	EE8501	Course Title	Power System Analysis			
Batch No.		Duration	90 Mins	Academic Year		2021-2022
Year/	III	Semester/ Section	V / A&B	Department		EEE

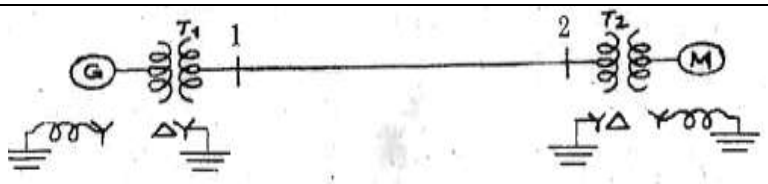
Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Define positive sequence impedance.	C301.4	R
2	Name the various unsymmetrical faults in a power system.	C301.4	R
3	Draw the zero sequence impedance equivalent circuit for delta-delta type three phase transformer.	C301.4	A
4	Define operator 'a' and express the value of 'a' and 'a2' in both polar and rectangular form.	C301.4	U
5	Express the unbalanced voltages in terms of symmetrical faults.	C301.4	AZ
6	Define stability.	C301.5	U
7	What is the significance of sub-transient reactance and transient reactance in short circuit studies?	C301.5	R
8	What are coherent machines?	C301.5	U
9	Define infinite bus in a power system.	C301.5	R
10	Define critical angle.	C301.5	R

Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Derive the expression for fault current in double line to ground fault on unloaded generator. Draw the equivalent network showing the interconnection of networks to simulate double line to ground fault.	C301.4	AZ, C
	OR		
12.	The reactance of an alternator rated 10 MVA, 6.9kV are $X_1=X_2=15\%$ and $X_{g0}=5\%$. The neutral of the alternator is grounded through a reactance of 0.38 Ohm. Single line to ground (SLG) fault occurs at the terminals of the alternator. Determine the line currents, fault current and the terminal voltages.	C301.4	AZ, E
13	A single line to ground fault (on phase a) occurs on the bus I of the system of shown in Figure 1.	C301.4	AZ, E

	 Figure 1 Using bus impedence (Z_{bus}) method, find i. Current in the fault ii. SC current on the transmission line in all the three phases iii. SC current in phase 'a' of the generator iv. Voltage of the healthy phases of the bus 1		
	OR		
14	Derive the expression for fault current in line to line fault on unloaded generator. Draw an equivalent network showing the interconnection of networks to simulate line to ground fault.	C301.4	AZ

Part – C Answer all the questions

Q. No.	Questions	CO	Skills
15	Write the swing equation describing the rotor dynamics of a synchronous machine connected to infinite bus through a double circuit transmission line.	C301.5	AZ, C
	OR		
16	a. Distinguish between steady state stability and dynamic stability (6) b. Discuss the classification of power system stability problems in the power system (7)	C301.5	AZ, U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff In Charge: Dr.M.V.Suganyadevi,ASP/EEE, Dr.K.Rajkumar, ASP/EEE

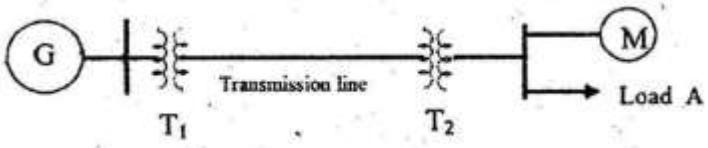
SARANATHAN COLLEGE OF ENGINEERING

Panjappur, Tiruchirapalli – 620 012

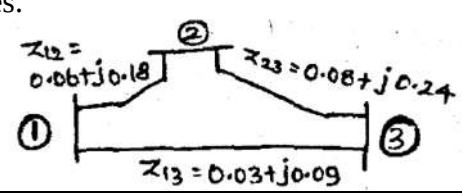
UNIT TEST			Date/ Session	02.12.2021	Marks	50
Course code	EE8501	Course Title	Power System Analysis			
Batch No.		Duration	90 Mins	Academic Year		2021-2022
Year/	III	Semester/ Section	V / A&B	Department		EEE

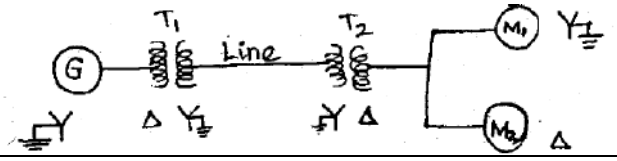
Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Draw the impedance diagram for the given single line representation of the power system. 	C301.1	R, A
2	Mention the requirements of planning the operation of a power system.	C301.1	R
3	Write the equation for per unit impedance if change of base occurs.	C301.1	A
4	What are the advantages of per unit system?	C301.1	A
5	What is the role of swing bus in power flow study?	C301.2	R
6	Explain the effect of acceleration factor in the load flow solution algorithm.	C301.2	U
7	What is Jacobian matrix?	C301.2	R
8	Give the frequency of various faults occurrence in ascending order.	C301.3	U
9	What are all the assumptions to be made to simplify the short circuit study?	C301.3	R
10	What is bolted fault or solid fault?	C301.3	R

Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Determine Y_{bus} for the 3 - bus system shown in figure. Neglect the shunt capacitance of the lines. 	C301.1	AZ, E

	OR		
12.	A 90 MVA, 11 kV 3 phase generator has a reactance of 25%. The generator supplies two motors through transformers and transmission line as shown in Figure. The transformer T_1 is a 3 – phase transformer, 100 MVA, 10/132 kV, 6% reactance. The transformer T_2 is composed of 3 single phase units each rated, 300 MVA, 66/110kV, with 5% reactance. The connections of T_1 & T_2 are shown. The motors are rated at 50 MVA, 10 kV and 20 % reactance. Taking the generator rating as base, draw reactance diagram and indicate the reactance in per unit. The reactance of line is 100 ohms. 	C301.1	AZ, E
13	Describe the step by step procedure for load flow solution from Gauss-Seidel method, if PV and PQ buses are present along with slack bus.	C301.2	AZ
	OR		
14	The one-line diagram of a simple three bus power system with generators at bus 1 and 2. The magnitude of voltage at bus 1 and 2 are adjusted t 1.06 and 1.05 p.u. The scheduled load at bus 2 is marked. Line impedances are marked to per unit on a 100 MVA base and the line charging is neglected. Solve by N-R method.	C301.2	AZ,E

Bus No.	Type	Generator (p.u)		Load (p.u)		Voltage (p.u)	Angle (Deg)	Reactive Power Limit	
		P_g	Q_g	P_d	Q_d			Q_{min}	Q_{max}
1	Slack	0	0	0	0	1.06	0	-	-
2	PQ	0	0	6	2.5	0	0	-	-
3	PV	2	0	0	0	1.05	0	0.1	2.5

Element	Bus Code	Self-impedance (Ω)
1	1-2	0.01+j0.05
2	1-3	0.07+j0.2
3	2-3	0.02+j0.15

Part – C Answer all the questions

Q. No.	Questions	CO	Skills
15	A generator is connected through a five cycle circuit breaker to a transformer is rated 100 MVA, 18 kV with reactances X_d"=20%, X_d'=25% and X_d=110%. It is operated on no-load and at rated voltage. When a 3 phase fault occurs between the breaker and the transformer, find i. Short circuit current in circuit breaker ii. The initial symmetrical rms current in the circuit breaker iii. The maximum possible dc component of the short circuit current in the breaker iv. The current to be interrupted by the breaker v. The interrupting MVA.	C301.3	AZ, E

Q. No.	Questions	CO	Skills
	OR		
16	A 11kV, 100 MVA alternator having a sub-transient reactance of 0.25 p.u is supplying a 50 MVA motor having a sub-transient reactance of 0.2 p.u through a transmission line. The line reactance is 0.05 p.u on a base of 100 MVA. The motor is drawing 40 MW at 0.8 p.f leading with a terminal voltage of 10.95 kV when a three phase fault occurs at the generator terminal. Calculate the total current in generator and motor under fault condition.	C301.3	AZ, E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff In Charge: Dr.M.V.Suganyadevi,ASP/EEE, Dr.K.Rajkumar, ASP/EEE

Saranathan College of Engineering
Tiruchirappalli - 620012

Internal Assessment Test – III			Date/Session	22-11-2021	Marks	50
Course code	EE8551	Course Title	Microprocessor & Microcontroller			
Batch No.		Duration	1 ½ hours	Academic Year	2021-2022/ODD	
Year	III	Semester	05	Department	EEE	

Part – A

Answer all the Questions (10 x 2 = 20 Marks)

Q. No.	Questions	CO	Skills
1	**What is the difference between MOVX and MOV ?**	C302.3	U
2	**What is the function of DPTR register?**	C302.3	R
3	**List any two applications of Microcontroller.**	C302.3	R
4	**Define the operation of i. XRL A, 50H ii. ADD A,#45H**	C302.3	U
5	**Name the major block of 8259 Programmable Interrupt Controller.**	C302.4	U
6	**Define the operation of i. XRL A, 50H ii. ADD A,#45H**	C302.4	R
7	**Draw the command word format of 8255 in I/O mode**	C302.4	R
8	**Mention the need for ADC and DAC in microcontroller circuits.**	C302.4	R
9	**Write the applications of Stepper motor.**	C302.5	A
10	**Write the applications of servomotors.**	C302.5	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	**Explain the Architecture, pin diagram and modes of operation of 8255.**	**C302.4**	**R**
	Or		
12	**Explain the Architecture, pin diagram and operation of 8259**	**C302.4**	**U**
13	**Explain any six Arithmetic & Data transfer Instructions of 8051**	**C302.3**	**R**
	Or		
14	**Explain any six Logical & Control transfer Instructions of 8051**	**C302.3**	**AZ**

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	**Write an ALP for finding Biggest number in a given series stored in the address of 4200 to 4209 and store the biggest number in the address 4500 using 8051 instruction.**	**C302.5**	**R**
	Or		
16	**With neat diagram explain the ALP for controlling stepper motor with microcontroller .**	**C302.5**	**U**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.M.Marimuthu & Dr.S.Vijayalakshmi

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	27-11-2021/ FN	Marks	50
Course code	EE8552	Course Title	Power Electronics			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year/	III	Semester/ Section	V / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	CO	Skils
1	Define duty cycle in DC chopper.	C303.3	A
2	What is meant by Time ratio control and Current Limit control.	C303.3	A
3	What are the different classifications of DC chopper.	C303.3	U
4	A Chopper circuit is operating on TRC at a frequency of 2 kHz on a 460 V supply. If the load voltage is 350 volts, calculate the conduction period of the MOSFET in each cycle.	C303.3	A
5	Draw the power circuit of Type E chopper.	C303.3	U
6	Write down the expression for the average output voltage for step up chopper?	C303.3	U
7	List out the applications of AC voltage controller.	C303.5	U
8	What is integral cycle control.	C303.5	U
9	What type of gating signal is used in single phase ac voltage controller with RL load?	C303.5	U
10	What is cyclo converters?	C303.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	CO	Skills
1	Draw the Schematics of Step down chopper and derive an expression for output voltage in terms of duty cycle.	C303.3	U
	or		
2.	A dc step down chopper has a resistive load of $R = 10\Omega$ and input voltage of V = 200 V. When chopper is ON, its voltage drop is 2 V and the chopping frequency is 1 kHz. If the duty cycle is 60%, determine • Average output voltage • RMS value of output voltage • Effective input resistance of chopper • Chopper efficiency.	C303.3	AZ, E
3.(a)	Explain the operation of single phase full wave AC voltage regulator feeding R load with help of voltage and current waveform.	C303.5	R&U
3.(b)	A 230V 50Hz ac supply is given to an R load (25Ω) through an ac voltage controller. Find Vo-rms Io-rms and input p.f for α=90 degree	C303.5	AZ,E
	or		
4.	Discuss the working of 2 stage sequence control of AC voltage controller with R load and derive the expression for Vo-rms	C303.5	R&U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	CO	Skills
5.	Explain the principle of working of the buck-boost chopper with a suitable waveforms and mode diagrams.	C303.3	U
	or		
6.	With a neat sketch and Output waveforms explain the working of a boost converter.	C303.3	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge:
Mr.R.Balasubramanian. Assoc.P / EEE
Mr.S.Ramprasath, A.P./EEE

Saranathan College of Engineering
Tiruchirapalli

Model Exam			Date/Session	29.12.21/AN	Marks	100
Course code	OMD551	**Course Title**	Basics of Biomedical instrumentation			
Batch No.		**Duration**	3 Hrs.	**Academic Year**	2021 - 2022	
Year/	III	**Semester/Section**	V/A&B	**Department**	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define action and resting potential	C406.1	U
2.	Classify the different types of electrodes.	C406.1	R
3.	Draw a typical ECG waveform.	C406.2	U
4.	Mention the frequency ranges of ECG and EEG	C406.2	U
5.	Define baud rate.	C406.3	R
6.	Define CMRR.	C406.4	U
7.	Explain the significance of isolation amplifier.	C406.4	R
8.	Define systolic and diastolic pressure.	C406.6	AZ
9.	Mention the pH value of arterial and veinous blood.	C406.6	R
10.	Explain the functions sodium and pottasium in our body.	C406.4	R

Part – B
(Answer all the questions 5 x 13= 65marks)

Q. No.	Questions	CO	Skills
11.a	Draw the action potential waveform and explain the origin of biopotential.	C406.1	U
	(Or)		
11.b	Examine the equivalent circuit of microelectrode and explain its electrical nature.	C406.1	U
12.a	Draw the recording set-up for ECG measurement and explain the blocks	C406.2	U
	(Or)		
12.b	Describe th 10 – 20 Electrode system used in EEG.	C406.2	A
13.a	Draw the circuit diagram of an ECG isolation amplifier and explain its operation.	C406.3	U
	(Or)		
13.b	Draw and explain the right-leg driven ECG for improving CMRR. Also discuss the various noises present during measurement.	C406.3	U
14.a	Explain the pulse rate measurement with neat diagram	C406.4	R
	(Or)		
14.b	Explain the ultrasonic blood flow measurement with neat sketch.	C406.4	R
15.a	Elaborate the operation of blood gas analyser	C406.5	E
	(Or)		
15.b	With neat diagram, explain the operation of blood cell counter.	C406.5	R

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	Write short notes on i) calorimeter ii) Spectrophotometer	C406.4	AZ
	(Or)		
16.b	With neat block diagram, explain the operation of auto analyser.	C406.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Name of the Faculty:
Mr.B.Paranthagan, ASP/EEE, Mr.R.Venugopal, AP/EEE

Saranathan College of Engineering
Tiruchirappalli - 620012

Unit Test			Date/Session	08.12.2021	Marks	50
Course code	EE8551	**Course Title**	Microprocessor & Microcontroller			
Batch No.		**Duration**	1 ½ hours	**Academic Year**	2021-2022/ODD	
Year	III	**Semester**	05	**Department**	EEE	

Part – A

Answer all the Questions (10 x 2 = 20 Marks)

Q. No.	Questions	CO	Skills
1	**Mention the uses of ALE in 8085.**	C302.1	U
2	**What is the function of HOLD & HLDA in 8085?**	C302.1	R
3	**What are the flags available in 8085?**	C302.1	R
4	**What is meant by SFR in 8051. Give an example.**	C302.3	U
5	**Name the Interrupts of 8051 Micro Controller.**	C302.3	U
6	**State any four features of 8051.**	C302.3	R
7	**Define the internal registers available in 8259.**	C302.4	R
8	**List the operation modes of 8255.**	C302.4	R
9	**Describe the applications of D/A converter interfacing with 8255?**	C302.4	A
10	**What are the salient features of ADC 0808.**	C302.4	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	**Describe the pin configuration of 8085 and explain them in detail.**	**C302.1**	**R**
	Or		
12	**Explain the timing diagram of LDA 5250**	**C302.1**	**U**
13	**Discuss about the block diagram of architecture 8051 .**	**C302.3**	**R**
	Or		
14	**Explain the different addressing modes of 8051.**	**C302.3**	**AZ**

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No.	Questions	CO	Skills
15	**Discuss the internal architecture and modes of operation of 8251**	**C302.4**	**R**
	Or		
16	**With neat diagram explain the interfacing of ADC & DAC with 8051.**	**C302.4**	**U**

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr.M.Marimuthu & Dr.S.Vijayalakshmi

Saranathan College of Engineering

Tiruchirappalli - 620012

Model			Date/Session	31.12.2021	Marks	100
Course code	EE8551	Course Title	Microprocessor & Microcontroller			
Batch No.		Duration	3 hours	Academic Year	2021-2022/ODD	
Year	III	Semester	05	Department	EEE	

Part – A (10 x 2 = 20 Marks)
Answer all the Questions

Q. No.	Questions	CO	Skills
1	Mention the purpose of SID and SOD lines.	C302.1	R
2	What are the important control signals in 8085 microprocessor?	C302.1	R
3	What is the significance of 'XCHG' and 'SPHL' instructions?	C302.2	U
4	Differentiate CALL and JUMP instructions	C302.2	U
5	List the advantages of microcontroller over microprocessor.	C302.3	R
6	What are the features of 8051?	C302.3	R
7	What are the basic modes of operation of 8255?	C302.4	R
8	What are the modes used in keyboard display?	C302.4	R
9	What are the addressing modes in 8051?	C302.5	R
10	What is the function of SCON register?	C302.5	R

Part – B
(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11a	With neat functional block diagram, explain the architecture of 8085 microprocessor.	C302.1	U
	Or		
11b	Illustrate the timing diagram of STA 8200 in 8085	C302.1	U
12a	With suitable example, discuss about 8085 instructions used for data manipulation.	C302.2	R
	Or		
12b	Write an ALP for finding largest number using 8085 instructions.	C302.2	A
13a	Draw the pin diagram of 8051 microcontroller and explain each pin in detail.	C302.3	R
	Or		
13b	Explain interrupt structure of 8051 in detail.	C302.3	R
14a	With neat block diagram, explain the operating modes of 8255.	C302.4	R
	Or		
14b	Draw and explain the architecture of 8279 keyboard/display controller.	C302.4	R
15a	Explain servomotor control using 8051.	C302.5	U
	Or		
15b	Briefly discuss how an ADC is interfaced to the 8051.	C302.5	U

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q.No.	Questions	CO	Skills
16a	Explain about washing machine control using Microcontroller programming	C302.5	U
	Or		
16b	Write an ALP to sort the 10 numbers stored in the array in Ascending order	C302.5	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: **Dr. M.Marimuthu & Dr. S.Vijayalakshmi**

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	29.10.2021	Marks	50
Course code	OMD 551	Course Title	BASICS OF BIOMEDICAL INSTRMENTATION			
Batch No.		Duration	90 mins	Academic Year		2020 - 2021
Year/	III	Sem. / Sec.	V/A & B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write about the placement of electrodes for EMG recording	C306.2	R
2	What are the electrodes used for EEG measurement?	C306.2	A
3	List the frequency ranges of the brain waves.	C306.2	A
4	Draw the placement of 10-20 lead system of EEG recording setup	C306.2	R
5	Differentiate unipolar mode from bi polar mode of recording setup	C306.2	AZ
6	Define the term latency in EMG	C306.3	A
7	What are the conclusions can be made out of EEG waveforms?	C306.3	R
8	Define EEG and EMG?	C306.3	U
9	What are the methods to ensure the patient safety	C306.3	R
10	Explain the special features of isolation amplifier	C306.3	R

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	With expression for CMRR explain in detail differential bio-amplifier along with a neat sketch	C306.3	R
	or		
12	With neat sketch explain in detail Right leg driven ECG amplifier	C306.3	AZ
13	Discuss in detail EMG also with neat diagram, explain unipolar and bipolar mode recording setup	C306.2	R
	or		
14	Explain in detail EEG – 10-20 electrode system along with bipolar and unipolar lead system.	C306.2	U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Explain the need for bio-amplifier; also write detailed notes about isolation amplifiers.	C306.3	U
	Or		
16	Write a detailed notes on : 1. Band pass filtering 2. Power line interference	C306.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Staff: B.Paranthagan & R.Venugopal

Saranathan College of Engineering

Tiruchirapalli

Unit Test -1			Date/ Session	13-12-21/AN	Marks	50
Course code	OMD 551	Course Title	Basics of Biomedical Engineering			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year	III	Semester/ Section	V /A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is bio potential?	C306.1	R
2	Define Bio electrodes	C306.1	AZ
3	What are the different types of electrodes	C306.1	R
4	Write a brief note on measurement using two electrodes?	C306.1	U
5	What is the frequency and amplitude of brain waves?	C306.2	U
6	Draw the Einthoven triangle	C306.2	R
7	What are the analysis can be made from ECG waveform?	C306.2	U
8	What is the need for bio amplifier?	C306.3	R
9	Define CMRR	C306.3	A
10	What are the various types of isolation amplifier used in biomedical applications?	C306.3	R

Part – B

(Answer all the questions 5 x 13 = 65marks)

Q. No.	Questions	CO	Skills
11.	Explain in detail the needle and micro electrodes and their equivalent circuits with relevant sketches	C306.1	U
	Or		
12	Elaborate on the major problems encountered while bio signal recording?	C306.1	AZ
13.	Explain detail the placement of electrodes for EEG measurement and also discuss about the recording setup of EEG.	C306.2	AZ
	Or		
14.	Describe in detail the EMG waveform recording with neat relevant diagrams	C306.2	U

Part – C

(Answer all the questions 1 x 15 = 15marks)

15.	Write a note on the right Leg Driven ECG amplifier with suitable diagrams	C306.3	A
	Or		
16.	Discuss in detail the various types of isolation amplifiers using in bio signal conditioning.	C306.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering

Tiruchirappalli - 620012

Model			Date/Session	27.12.2021	Marks	100
Course code	EI 8075	**Course Title**	Fibre optics and Laser Instruments.			
Batch No.		**Duration**	3 hours	**Academic Year**	2021-2022/ODD	
Year	IV	**Semester**	07	**Department**	EEE	

Part – A (10 x 2 = 20 Marks)
Answer all the Questions

Q. No.	Questions	CO	Skills
1	Define – Absorption losses.	C404.1	U
2	What are the various types of Scattering possible in a fibre ?	C404.1	A
3	What are the different types of fiber optics sensor?	C404.2	U
4	Define – Intrinsic sensor.	C404.2	U
5	What material components are used in Liquid Lasers.	C404.3	R
6	Define population inversion.	C404.3	C
7	Define LIDAR.	C404.4	C
8	What are the advantages of Laser welding?	C404.4	U
9	Define principle of holography.	C404.5	C
10	Write the application of lasers in medical field.	C404.5	U

Part – B
(Answer all the questions 5 x 13 = 65 marks)

Q. No.	Questions	CO	Skills
11a	Elaborately discuss Light Emitting Diode (LED) and PIN Diode with neat sketches.	C404.1	C
Or			
11b	What are the different types of fibres? Explain any two types of fibre optics in detail	C404.1	A
12a	Discuss in detail about the measurement of temperature and current using fibre optics.	C404.2	R
Or			
12b	Write extensively about End reflection method and Near field scanning techniques.	C404.2	A
13a	Write a brief notes on the following a. YAG lasers b. Q-switching and mode locking	C404.3	A
Or			
13b	What are the different types of Laser modes ? Explain any two types of Laser modes in detail	C404.3	A

14a	What is Laser Welding? Discuss in detail about the Conduction Limited Melting and Key Hole Melting with neat diagram.	C404.4	A
Or			
14b	Briefly discuss about constructing and working of LIDAR.	C404.4	R
15a	Write a brief note on (1) laser Tissue Interactions and Photochemical reactions, (2) Thermalisation (3) collisional relaxation	C404.5	R
Or			
15b	Discuss in detail about the Holography for non-destructive testing with neat diagram	C404.5	A

Part – C
(Answer all the questions 1 x 15 = 15marks)

Q.No.	Questions	CO	Skills
16a	Discuss in detail about reconstructing and viewing the holographic image.	C404.5	A
Or			
16b	Write a detailed notes on Laser instruments for brain surgery and removal of tumors of vocal cards.	C404.5	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the Faculty In-charge: Dr. M.Marimuthu & Mr. Venugopal R

Saranathan College of Engineering
Tiruchirappalli

UNIT TEST 1			Date/ Session	10-12-2021 AN	Marks	50
Course code	EI8075	Course Title	Fibre Optics and Laser Instrumentation			
Batch No.		Duration	90 mins	Academic Year	2021 – 2022	
Year	IV	Semester/Section	VII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Differentiate Step index and graded index fibers	C404.1	E
2.	What are the Optical sources used for fibre optical communications ?	C404.1	R
3.	What are the Principles of light propagation through a fibre?	C404.1	C
4.	Define Numerical aperture and Skew mode.	C404.1	U
5.	What are the types of fiber optics sensor	C404.2	U
6.	Define Electro-optic modulator (EOM)	C404.2	A
7.	List the industrial applications of Laser	C404.2	R
8.	What are the different Lasers levels possible	C404.3	C
9.	What are the various types of lasers;	C404.3	U
10.	Define Coherence in laser	C404.3	U

Part – B
(Answer all the questions 2 x 10= 20marks)

Q. No.	Questions	CO	Skills
11	Discuss in detail the Principles of light propagation through a fibre by explaining the terms (1) Total internal reflection, (2) Acceptance angle (θa),	C404.1	A
	Or		
12	What are the different Scattering occurring with fibre optics and explain in detail any two scattering losses?	C404.1	U
13	Discuss in detail the Measurement of attenuation using fibre optics by cut back method	C404.2	C
	Or		
14	Explain the processes involved in detail interferometric method of measurement of length in fibre optics. also write a note on Moire fringes	C404.2	A
	Part – C **(Answer all the questions 1 x 10= 10marks)**		
15	List the Properties of laser, and explain in detail the all the properties lasers with neat relevant diagrams.	C404.3	R
	Or		
16	Discuss in detail the construction working of semiconductor lasers with neat appropriate diagrams.	C404.3	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Mr. Venugopal R, AP/EEE, Dr. M Marimuthu, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Model Exam			Date/Session	22.12.21/AN	Marks	100
Course code	EE8702	**Course Title**	POWER SYSTEM OPERATION AND CONTROL			
Batch No.		**Duration**	180 mins	**Academic Year**	2021 - 2022	
Year/	IV	**Semester/Section**	VII/A&B	**Department**	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Distinguish between load curve and load duration curve.	C402.1	R
2.	Define plant capacity factor	C402.1	E
3.	State the control objective of two area load frequency control	C402.2	C
4.	Find the open loop gain of an Automatic voltage regulator if the static loop error does not exceed 2%.	C402.2	AZ
5.	List the various components of AVR loop	C402.3	AZ
6.	What is the function of exciter?	C402.3	AZ
7.	Draw the incremental cost curve of thermal unit.	C402.4	AZ
8.	State the different constraints in unit commitment problem.	C402.4	R
9.	What are the functions of SCADA?	C402.5	U
10.	Define State estimation	C402.5	R

Part – B

(Answer all the questions 5 x 13= 65marks)

<table>
<tr><th>Q. No.</th><th>Questions</th><th>CO</th><th>Skills</th></tr>
<tr><td>11.a</td><td>A power station has to meet the following demand
Group A: 200kW between 8 A.M and 6 P.M.
Group B : 100 kW between 6 A.M and 10 A.M
Group C : 50 kW between 6 A.M and 10 A.M
Group D: 100 kW between 10 A.M and 6 P.M and then between 6 P.M and 6 A.M.
Plot the daily load curve and determine (i) diversity factor (ii) units generated per day (iii) load factor.</td><td>C402.1</td><td>A</td></tr>
<tr><td colspan="4">(Or)</td></tr>
<tr><td>11.b</td><td>Two generators rated 200 MW and 400 MW are operating in parallel. The droop characteristics of their governors are 4% and 5% respectively from no load to full load. Assuming that the generators are operating at 50 Hz at no load, how would a load of 600 MW be shared between them? What will be the system frequency at this load? Assume free governor operation. Also find the load sharing if both governors have a drop of 4%.</td><td>C402.1</td><td>U,E</td></tr>
<tr><td>12.a</td><td>A two area system connected by a tie line has the following parameters with base MVA for each area with the frequency of 50 Hz and synchronizing power coefficient T12 =2 pu. A load change of 400 MW occurs in area 1. Determine the steady state frequency deviation and the change in tie line flow.
<table>
<tr><td>Area</td><td>1</td><td>2</td></tr>
<tr><td>Turbine output power</td><td>2000 MVA</td><td>1000 MVA</td></tr>
<tr><td>Inertia constant</td><td>3 %</td><td>4 %</td></tr>
<tr><td>Generator gain constant</td><td>50 Hz/pu MW</td><td>40 %</td></tr>
<tr><td>Governor time constant</td><td>0.3</td><td>0.2</td></tr>
<tr><td>Turbine time constant</td><td>0.6</td><td>0.4</td></tr>
</table></td><td>C402.2</td><td>U</td></tr>
<tr><td colspan="4">(Or)</td></tr>
</table>

12.b	Obtain the block diagram model of the two area system and explain the salient features of static and dynamic conditions	C402.2	R
13.a	Draw the diagram for a typical excitation system and develop the transfer function model of the excitation system. Explain the operation of static exciter system	C402.3	A
	(Or)		
13.b	Explain the different methods of voltage control	C402.3	R
14.a	A two bus system shown in Fig. 14 (a). If 100 MW is transmitted from plant 1 to the loa, a transmission loss of 10 MW is incurred. Find the required generation for each plant and power received by load when the system incremental cost is 25 MW-hr. The cost equation of the two plants are given below. $F_1 = 0.01\ P_1^2 + 16\ P_1 + 180$ Rs/hr $F^2 = = 0.02\ P_2^2 + 160P^2 + 16$ Rs/hr 	C402.4	E
	(Or)		
14.b	Derive Coordination equation for the ED problem with and without losses and also explain the solution by using gradient method	C402.4	R
15.a	Explain the various functions of Energy Management Systems	C402.5	A
	(Or)		
15.b	Draw and explain the operation of SCADA with neat diagram	C402.5	U

Part – C
(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	A power plant has three units with the following cost equations $C_1 = 0.02P_1^2 + 1.95\ P_1 + 100$ Rs/hr $C_2 = 0.015\ P_2^2 + 2.10\ P_2 + 120$ Rs/hr $C_3 = 0.005\ P_3^2 + 2.20\ P_3 + 130$ Rs/hr Find the optimum scheduling for a total load of 300 MW.	C402.5	R
	(Or)		
16.b	The incremental cost characteristics of the plants are $IC_1 = 0.02P_1 + 22$ Rs/Mwhr $IC_2 = 0.04P_2 + 20$ Rs/Mwhr The system load is entirely concentrate at plant 2.For transfer of 80MW from plant 1to plant 2 the transmission loss is found to be 14MW.for this system compute optimum scheduling for a total received power of 150MW.	C402.5	E

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Staff In Charge: Dr.M.V.Suganyadevi,ASP/EEE. *Mr. R.Satheesh, AP/EEE*

SARANATHAN COLLEGE OF ENGINEERING

Tiruchirapalli-620 012.

Model Examination			Date/Session	24.12.2021/AN	Marks	100
Course code	EE8701	Course Title	HIGH VOLTAGE ENGINEERING			
Batch No.		Duration	3 Hours	Academic Year	2021 - 2022	
Year/	IV	Semester/Section	VII / A&B	Department	EEE	

PART – A

(Answer all the questions 10 × 2 = 20 Marks)

Q. No.	Questions	CO	Skills
1	List the sources of switching over voltages in power system.	C401.1	U,R
2	Write the mathematical model of lightning.	C401.1	AZ
3	Define corona critical disruptive voltage.	C401.2	R
4	State Paschen's law.	C401.2	U
5	Draw the two types of impulse current waveforms.	C401.3	U,R
6	Differentiate the spark over, flash over and puncture.	C401.3	U
7	List out various digital techniques in high voltage measurement.	C401.4	R
8	What are the drawbacks of resistance potential divider?	C401.4	A,U
9	Define air density correction factor.	C401.5	A
10	Define insulation coordination.	C401.5	R

PART – B

(Answer all the questions) 5 × 13 = 65 marks)

Q. No.	Questions	CO	Skills
11 a	Explain the different theories of charge formation in the cloud.	C401.1	A,U
	or		
11.b	Write short notes on: (a) Rod gaps used as protective devices (b) Ground wires for protection of overhead lines.	C401.1	R
12.a	Explain the dielectrics characteristics of liquid dielectrics and also explain the liquid purification system.	C401.2	U,R
	or		
12.b.	Explain about the breakdown mechanisms in solid dielectrics with neat sketches.	C401.2	E
13.a.	Explain with diagrams, different types of rectifier circuits for producing high D.C. voltages.	C401.3	U
	or		
13.b.	What is the principle behind the electrostatic energy conversion methods? Explain the construction and operation of Van de Graaff generator. Also enlist the advantages and limitations of the same.	C401.3	AZ
14.a	Explain any two methods to measure high impulse current.	C401.4	U,A
	or		
14.b	With neat circuit diagram explain the capacitance potential transformer (CVT). Draw the necessary phasor diagram.	C401.4	AZ
15.a	Explain the different high voltage tests done on bushing.	C401.5	AZ
	or		

15.b	Briefly discuss the various tests carried out the insulator.	C401.5	U

PART – C

(Answer all the questions 1 × 15 = 15 Marks)

16.a	Explain the working of Cockroft-Walton voltage multiplier circuit under unloaded and loaded conditions. Give the expression for ripple and regulation in voltage multiplier circuits. How are the ripple and regulation minimized?	C401.6	AZ
	or		
16.b	A ten stage Cockraft-Walton circuit has all capacitor of 0.04μF the secondary voltage of the supply transformer is 120 kV at a frequency of 150 Hz. If the load current is 1.2 milliamps, determine (i) voltage regulation, (ii) the ripple, (iii) the optimum number of stages for maximum output voltage, (iv) the maximum output voltage.	C401.6	AZ

Bloom's skills: Remember (R), Understand (U), Apply (A), Analyze(AZ), Evaluate (E), and Create (C)

Faculty In-Charge: Mr.R.Vijay & Dr.K.Rajkumar

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	27.11.2021	Marks	50
Course code	EE 8010	Course Title	Power System Transients			
Batch No.		Duration	90 mins	Academic Year	2021 – 2022	
Year/	IV	Semester/ Section	VII/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Write down the equations for voltage ad current travelling waves.	C315.5	R
2	What is meant by reflection coefficient?	C315.5	R
3	What is meant by refraction coefficient?	C315.5	U
4	Explain the values of reflected and refracted waves for short circuit termination	C315.5	U
5	Explain the values of reflected and refracted waves for open circuit termination	C315.5	U
6	What is Bewley's lattice diagram?	C315.5	R
7	Write down the expressions for V2 and V3 for capacitive termination.	C315.5	U
8	Write down the expressions for V2 and V3 for inductive termination.	C315.5	R
9	What is meant by kilometric fault?	C315.6	R
10	What is EMTP?	C315.6	R

Part – B

(Answer all the questions 2 x 10 = 20marks) Maximum 2 splits/Question

Q. No.	Questions	CO	SKILLS
11	Derive the expressions for reflection and refraction coefficients	C315.5	R
	Or		
12	Explain how travelling waves behave for open circuit termination	C315.5	A
13 a	Explain how travelling waves behave for short circuit termination	C315.5	A
13 b	Explain the significance of Bewley's lattice diagram	C315.5	U
	Or		
14	Explain how lattice is constructed with relevant expressions.	C315.5	U

Part – C

(Answer all the questions 1 x 10 = 10marks) Case study or Analytical type

Q. No.	Questions	CO	Skills
15	Explain the kilometric fault with neat waveforms.	C315.6	U
	Or		
16	Explain about line dropping and load rejection and write short notes on EMTP.	C315.6	U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Saranathan College of Engineering
Tiruchirapalli

Revision Test - I			Date/ Session	06.12.2021/AN	Marks	50
Course code	EE8702	Course Title	POWER SYSTEM OPERATION AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year/	IV	Semester/ Section	VII / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What is plant use factor?	C412.1	R
2.	Define diversity factor.	C412.1	R
3.	Distinguish between Load curve and Load duration curve.	C412.1	R,A
4.	What are the requirements for parallel operation of alternators?	C412.1	R
5.	List the advantages of multi-area operation.	C412.2	R
6.	Define stiffness of the interconnected system.	C412.2	R
7.	What is Area Control Error (ACE)?	C412.2	R
8.	Compare Unit commitment with Economic load dispatch.	C412.4	R,A
9.	What is the purpose of economic dispatch?	C412.4	A
10.	Write the relationship between incremental fuel cost and power demand when the cost curve is given.	C412.4	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	A power plant is having the following annual factors: Load factor = 0.75; Capacity factor = 0.6; Use factor = 0.65; Maximum demand is 60MW. Estimate the (a) Annual energy production, (b) Reserve capacity over and above the peak load and (c) Hours during which the plant is not in operation.	C412.1	E
	OR		
12.	Two generators rated 400 MW and 700 MW are operating in parallel. The droop characteristics of their governors are 3% and 4% respectively from no load to full load. Assuming that the governors are operating at 50 Hz at no load, how would a load of 1000 MW be shared between them? What will be the system frequency at this load? Assume linear governor operation. Determine the full load speed of each machine.	C412.1	E
13.	Obtain the transfer function model of a single area system and prove that the change in steady state frequency is zero with integral controller.	C412.2	AZ
	OR		
14.	A two area power system has two identical areas with following parameters and operating conditions: Rated capacity of the area = 1500 MW; Normal operating load = 750 MW; Nominal frequency = 50 Hz; Inertia constant of the area = 5 seconds; Speed regulation of all regulating generators = 3% Damping coefficient = 1% Governor time constant = 0.06 seconds Turbine time constant = 0.25 seconds A load increase of 30 MW occurs in area 1. (i) Determine the steady state values of deviation in frequency and change in tie line power. (ii) Compare the steady state frequency deviation obtained in single area and comment on the support.	C412.2	AZ

Part – C
(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	Determine the economic operating point for the following units when delivering a load of 850 MW. Unit 1: Coal fired steam unit: $H_1 = 510 + 7.2\ P_1 + 0.00142\ P_1^2$; 150 MW $\leq P_1 \leq$ 600 MW Unit 2: oil fired steam unit: $H_2 = 310 + 7.85\ P_2 + 0.00194\ P_2^2$; 100 MW $\leq P_2 \leq$ 400 MW Unit 3: oil fired steam unit: $H_3 = 78 + 7.97\ P_3 + 0.00482\ P_3^2$; 50 MW $\leq P_3 \leq$ 200 MW Following are the fuel costs in Rs/Mbtu. Unit 1: $k_1 = 0.9$ Unit 2: $k_2 = 1$ Unit 3: $k_3 = 1$	C412.4	A
	OR		
16	The input-output characteristics of 3 units (in Rs./h) are $F_1 = 0.0016\ P_{G1}^2 + 5.46\ P_{G1} + 940$ $F_2 = 0.0019\ P_{G2}^2 + 5.35\ P_{G2} + 820$ $F_3 = 0.0032\ P_{G3}^2 + 5.65\ P_{G3} + 99$ The total load is 600 MW. Use the participation factor method to calculate the dispatch for a load is reduced to 550 MW.	C412.4	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - II			Date/ Session	25.11.2021/ FN	Marks	50
Course code	EE8703	**Course Title**	Renewable Energy Systems			
Batch No.		**Duration**	90 mins	**Academic Year**	2021-2022	
Year	IV	**Semester/ Section**	VII/A&B	**Department**	EEE	

Part – A

(Answer all the questions 5 × 2 = 10 marks)

Q. No.	Questions	CO	Skills
1	Define tidal range.	C403.5	R
2	Define the following terms a) Spring tides b) Neap tides	C403.5	R
3	List out the advantages of small hydro schemes.	C403.5	U
4	Define the following terms a) Forebay b) Penstock c) Tailrace	C403.5	R
5	What is meant by OTEC?	C403.5	U
6	Define fuel cell	C403.6	R
7	Write any two benefits of cogeneration	C403.6	U
8	What are the advantages of bio-diesel as engine fuel?	C403.6	U
9	What are the types of Gasifiers?	C403.6	U
10	What are the advantages of bio-diesel as engine fuel?	C403.6	U

Part – B

(Answer all the questions 2 × 10 = 20 marks)

Q. No.	Questions	CO	Skills
11	Draw the Schematic Diagram of the Standalone Solar Photovoltaic System. What are the Main components used in it? Explain their function.	C403.5	A
	Or		
12	Discuss the following: i. OTEC open cycle. ii. OTEC closed (Anderson) cycle	C403.5	A
13	Explain the essential features of a hydrogen–oxygen cell. Draw a suitable diagram of this cell and give the reactions took place at the electrodes.	C403.6	A
	Or		
14	Describe the different methods of energy storage system.	C403.6	A
	Part – C **(Answer all the questions 1 × 10 = 10 marks)**		
15	Describe in detail the operation of pumped storage hydro power plant.	C403.5	A
	Or		
16	Sketch and describe any two type of bio-mass gas generation plant. Mention 4 uses of the biogas produced.	C403.5	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.S.Ramprasath, AP/EEE, Dr.P.Ram Prakash, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Model Theory Examination			Date/Session	29.12.21/AN	Marks	100
Course code	EE8703	Course Title	RENEWABLE ENERGY SYSTEMS			
Batch No.		Duration	180 mins	Academic Year	2021 - 2022	
Year/	IV	Semester/Section	VII/A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	List out the major factors influencing the amount of Green House Gas emissions.	C403.1	U
2.	Define Energy Utility factor	C403.1	U
3.	Define Power Co-efficient of WECS and draw the Power Vs wind speed characteristics of wind turbine.	C403.2	R
4.	Why utilization of wind is considered as part of solar technology?	C403.2	U
5.	What are the performance indices of a solar collector?	C403.3	R
6.	List the components of heliostat.	C403.4	R
7.	Give the types of geothermal conversion technology used for Electrical Power generation.	C403.4	U
8.	What is cogeneration?	C403.5	R
9.	What are the main components of Stirling Engine?	C403.6	R
10.	List out the advantages of small hydro schemes.	C403.6	U

Part – B

(Answer all the questions 5 x 13= 65marks)

Q. No.	Questions	CO	Skills
11.a	(i) Analyze the availability and efficiency of conversion of non-conventional energy sources in India. State the important features of availability and efficiency as found from this analysis. (9) (ii) List the Advantage and Disadvantages of conventional energy systems. (4)	C403.1	AZ
	(Or)		
11.b	(i) Compare the energy consumption pattern in various sections in India. Discuss the growth rate of energy requirements and power generation in India. (9) (ii) Explain about the Environmental consequences of fossil fuels. (4)	C403.1	AZ
12.a	(i) Explain briefly about the types of wind mills with neat Sketch. (8) (ii) With neat diagram, Explain the preliminary design of wind electric system. (5)	C403.2	AZ
	(Or)		
12.b	(i) Describe in detail the site selection procedure of a wind power plant. (6) (ii) Explain briefly about grid integration issues in wind power plants. (7)	C403.2	AZ
13.a	Draw the Schematic Diagram of the Grid Connected Solar Photovoltaic System. What are the Main components used in it? Explain their function.	C403.3	AZ
	Or		
13.b	(i) Draw illustrative diagram showing all the important components of solar heating and solar cooling unit. Explain the working principles of these devices. (7) (ii) Explain with neat diagram solar space cooling and solar pond electric power plant. (6)	C403.3	AZ

14.a	Describe in detail the construction and working of various types of bio-gas plants. State the merits and demerits of the biogas power plant.	C403.4	AZ
	Or		
14.b	(i) Draw the layout of geothermal power plant and explain its operation. (6) (ii) Estimate the power available from a micro hydro scheme at a site having a small stream with 100 litres per second flow at a head of 30 m. Assume density of fresh water as 996 kg/m^3 and overall efficiency of the whole system as 55%. (7)	C403.4	AZ
15.a	(i) Explain the working of a tidal power plant and the two way operating cycle for its units. (7) (ii) Explain in detail the general arrangements for generating units in tidal power plants. What are its merits and demerits? (6)	C403.6	AZ
	Or		
15.b	Explain the essential features of a hydrogen–oxygen cell. Draw a suitable diagram of this cell and give the reactions took place at the electrodes.	C403.6	AZ

Part – C

(Answer all the questions 1 x 15 = 15marks)

Q. No.	Questions	CO	Skills
16.a	(i) What is called Maximum Power Point Tracking (MPPT)? List the different types of MPPT algorithms used in Solar Photovoltaic System. Explain the Incremental Conductance algorithm with neat flowchart. (10) (ii) Determine the TSR of a 6 m long blade that turns 42 rpm in a 4 m/s wind. (4)	C403.5	AZ
	(Or)		
16.b	(i) Determine the overall power coefficient for a wind turbine with a rated power of 3 MW, speed 18 m/s and blade diameter 40 metre. (8) (ii) Determine the efficiency of a turbine with 6 m blades if it produces 65 kW in a 15 m/s wind. Assume an air density of 1.2 kg/m^3 (7)	C403.5	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Name of the faculty: Mr.S.Ramprasath, AP/EEE, Dr.P.Ram Prakash, AP/EEE.

Saranathan College of Engineering
Tiruchirapalli

Unit Test			Date/ Session	08.12.2021/AN	Marks	50
Course code	EE8010	Course Title	Power System Transients			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year	IV	Semester / Sec	VII-A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is arcing ground?	C420.1	U
2	What do you mean by double frequency transients?	C420.1	U
3	Mention the various causes for power system transients.	C420.1	U
4	What is capacitive switching?	C420.2	U
5	Define ferro-resonance.	C420.2	R
6	Mention the objectives of resistance switching.	C420.2	R
7	What are the causes of over-voltages?	C420.3	U
8	Define Isokeraunic Level.	C420.3	R
9	What are factors affecting the mechanical design of overhead transmission lines?	C420.3	R
10	Define angle of protection in transmission lines.	C420.3	R

Part – B
(Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	Explain various sources of transients.	C420.1	R
	(OR)		
12	Explain the RL circuit transient with sine wave excitation.	C420.1	AZ
13	Explain resistance switching and draw its equivalent circuit for interrupting the resistor current.	C420.2	AZ
	(OR)		
14	Explain about current chopping in interrupting of low magnetizing current.	C420.2	R
	PART – C **(Answer all the questions 1 x 10 = 10marks)**		
15	Explain about various theories in the formation of clouds and charge formation.	C420.3	U
	(OR)		
16	Explain about various protections in power system against lightning.	C420.3	R

Bloom's Skills: Remember ©, Understand (U), Apply (A), Analyze (AZ), Evaluate © and Create (C). Skill need to be mentioned against each question

Staffs: Prof.B.Paranthagan, ASP/EEE , Prof. R.Sridhar, AP/EEE.

Saranathan College of Engineering
Tiruchirapalli

Internal Assessment Test - III			Date/ Session		Marks	50
Course code	EE8017	Course Title	HIGH VOLTAGE DIRECT CURRENT TRANSMISSION			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year	IV	Semester/ Section	VIII / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Distinguish between characteristic and non-characteristic harmonics.	C410.4	U
2	What are the causes for generation of non-characteristics harmonics?	C410.4	AZ
3	What are the demerits of synchronous condensers?	C410.4	R
4	What are the various problems associated with the injection of harmonics?	C410.4	R
5	What is the significance of power flow analysis in AC/DC systems?	C410.5	U
6	What are the various types of AC filters?	C410.5	R
7	What are the four basic variables in a converter used for DC load flow solution?	C410.5	R
8	Give the procedure for DC load flow solution	C410.6	AZ
9	What are the assumptions made in DC load flow?	C410.6	U
10	Write the equations describing the DC network.	C410.6	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q.No.	Questions	CO	Skills
11	Explain in detail, the principle of operation and V-I characteristics of SVC.	C410.4	AZ
	or		
12	Explain in detailed about requirement of reactive power in HVDC converter under steady state and how they are affected by the converter control methods.	C410.4	R
13	Explain detail about the analysis of single tuned AC filters and write the design criteria for AC filters.	C410.5	AZ
	or		
14	Explain in detail, the design of DC filters.	C410.5	AZ
15	With a neat flow chart explain the solution of AC-DC power flow.	C410.6	AZ
	or		
16	Explain in detail, the per unit system of DC quantities and inclusion of constraints.	C410.6	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name: Dr.S.Vijayalakshmi (A-Sec) & Mrs.N.Gayathri (B-Sec)

SARANATHAN COLLEGE OF ENGINEERING
Tiruchirapalli

Internal Assessment Test - III			Date/Session	22.11.2021/FN	Marks	50
Course code	EE8701	Course Title	HIGH VOLTAGE ENGINEERING			
Batch No.		Duration	90 Mins	Academic Year	2021 - 2022	
Year/	IV	Semester/Section	VII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What is Rogowski coil? Give its limitations.	C401.4	R
2	For what measurement are Hall generators normally used?	C401.4	R
3	What type of measuring devices is preferred for measurement of Impulse currents of short duration?	C401.4	R,U
4	What are the advantages and disadvantages of CVT measurement in HVAC?	C401.4	U,R
5	Why are capacitive voltage dividers preferred for AC high voltage measurements?	C401.4	U
6	Define Disruptive discharge voltage.	C401.5	AZ
7	Define safety margin as applied to be insulation co-ordination.	C401.5	R
8	Explain the reasons for conducting wet tests on high voltage apparatus and give the specifications of the water used for wet tests.	C401.5	U
9	What is the significance of impulse tests?	C401.5	R
10	What are the atmosphere correction factors and mention their influence in high voltage testing.	C401.5	R

Part – B
(Answer all the questions) 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11	What is CVT? Explain through phasor diagram how a tuned CVT can be used for HVAC measurement in substations. And also explain series capacitor peak voltmeter.	C401.4	R,U
	or		
12	With a neat sketch explain the principle of operation of an electrostatic voltmeter for HVAC measurement. What are the merits and demerits?	C401.4	A,R
13	Explain measurements of very high voltages using sphere gaps. Mention merits and de merits of using sphere gaps& also explain digital peak voltmeter & rod gaps.	C401.4	U,R
	or		
14	Explain the construction features and operation of generating type voltmeter with neat diagram.	C401.4	U,R

Part – C
(Answer all the questions 1 x 10 = 10marks)

15	Discuss the various test carried out in a circuit breaker at HV labs.	C401.5	AZ
	Or		
16	Explain in sequence the various HV tests being carried out in power transformers.	C401.5	U,R

Bloom's skills: Remember (R), Understand (U), Apply (A), Analyze(AZ), Evaluate (E), and Create (C)

Faculty In-Charge: Mr.R.VIJAY & Dr.K.Rajkumar

SARANATHAN COLLEGE OF ENGINEERING

Panjappur, Tiruchirapalli – 620 012

UNIT TEST			Date/ Session	13.12.2021	Marks	50
Course code	EE8701	Course Title	High Voltage Engineering			
Batch No.		Duration	90 Mins	Academic Year		2021-2022
Year/	IV	Semester/ Section	VII / A&B	Department		EEE

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	Give the types of electrical discharge in gases.	C401.2	R
2	What are the conditions in the gases that govern the ionization process?	C401.2	R
3	Define statistical time lag and formative time lag.	C401.2	A
4	Write the expression to find the optimum number of stages and % ripple in a voltage multiplier circuit.	C401.3	U
5	What are the limitations of Van de Graff generator?	C401.3	AZ
6	How is the wave front and wave tail times controlled in impulse generator circuits?	C401.3	U
7	Draw the standard impulse waveform and mark the standard specifications.	C401.3	R
8	State the demerits of CVT measurement for HVAC measurement.	C401.4	U
9	What are the types of peak reading AC voltmeter?	C401.4	R
10	Explain the merits and demerits of analog and digital techniques used for high voltage measurements.	C401.4	R

Part – B (Answer all the questions 2 x 10 = 20marks)

Q. No.	Questions	CO	Skills
11.	Deduce the Townsend's break down criteria. Also define the Townsend's primary and secondary ionization coefficients.	C401.2	AZ, C
	OR		
12.	Explain the different mechanism by which breakdown occurs in solid dielectric in practice.	C401.2	AZ, E
13	What is Tesla coil? How are damped high frequency oscillations obtained from a Tesla coil?	C401.3	AZ, E
	OR		
14	Give the Marx circuit arrangement for multistage impulse generators. How is the basic arrangement modified to accommodate the wave time control resistances?	C401.3	AZ

Part – C Answer all the questions

Q. No.	Questions	CO	Skills
15	Explain the construction and operation of different types of shunt. (or) What are the different types if resistive shunts used for impulse current measurements? Discuss their characteristics and limitations.	C401.4	AZ, C
	OR		
16	With neat diagram, illustrate the measurement of HVAC using digital technique.	C401.4	AZ, U

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Staff In Charge: Dr.K.Rajkumar, ASP/EEE & Mr.R.Vijay, AP/EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	2-12-2021/ AN	Marks	50
Course code	EE8703	Course Title	Renewable Energy Systems			
Batch No.		Duration	90 mins	Academic Year	2021 - 2022	
Year/	IV	Semester/ Section	VII / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q.No	Question	Skils
1	What is meant by non – commercial energy?	A
2	List out the major factors influencing the amount of Green House Gas emissions.	A
3	What are the environmental concerns of geo thermal energy?	U
4	Define solar time.	A
5	List the components of heliostat.	U
6	What is concentration ratio?	U
7	Mention the properties for working fluid in OTEC power plant.	U
8	What is the potential of geothermal resources in India?	U
9	What are different materials used for fabrication of solar cells?	R
10	List the classifications of small hydro power stations based on capacity, load and scheme.	U

Part – B

(Answer all the questions 2 x 10 = 20marks)

Q.No	Questions	Skills
11.	Analyze the availability and efficiency of conversion of non-conventional energy sources in India. State the important features of availability and efficiency as found from this analysis	U
	OR	
12.	Compare the energy consumption pattern in various sections in India. Discuss the growth rate of energy requirements and power generation in India.	R&U
13.	Draw the Schematic Diagram of the Standalone Solar Photovoltaic System. What are the Main components used in it? Explain their function.	R&U
	OR	
14.	What is called Maximum Power Point Tracking (MPPT)? List the different types of MPPT algorithms used in Solar Photovoltaic System. Explain the Perturb & Observe algorithm with neat flowchart.	R&U

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q.No	Questions	Skills
15.	(i) Explain the operation of Grid Connected Solar Photovoltaic System with and without Battery backup. (ii) A site has 6 hours of peak sunlight per day in March. If 15 kWh is required on an average March day from a grid-free system, what power is required from the array for this month? (Assume 65% efficiency.)	U, AZ
	OR	
16.	Explain the essential features of a hydrogen–oxygen cell. Draw a suitable diagram of this cell and give the reactions took place at the electrodes.	U, AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty In charge: *EEE IV- A Section: Mr.S.Ramprasath*, A.P./EEE

EEE IV- B Section: Dr.P. Ram Prakash, A.P / EEE

Saranathan College of Engineering

Tiruchirapalli

Internal Assessment Test - III			Date/ Session	23.11.2021/FN	Marks	50
Course code	EE8702	Course Title	POWER SYSTEM OPERATION AND CONTROL			
Batch No.		Duration	90 mins	Academic Year	2020-2021	
Year/	IV	Semester/ Section	VII / A & B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	Define unit commitment	C402.4	R
2.	What is meant by minimum- up time and Minimum down time constraints	C402.4	U
3.	Define Incremental transmission loss(ITL)	C402.4	AZ
4.	What are the three different methods for solving Unit commitment Problem?	C402.4	R
5.	What is meant by Priority list method?	C402.4	AZ
6.	What is the function of Data Acquisition System (DAS)	C402.5	U
7.	List some important control system functions	C402.5	R
8.	What are the functions of energy control centre and write the various levels?	C402.5	U
9.	List the different states of power system?	C402.6	R
10.	What are the functions of SCADA	C402.6	A

Part – B

(Answer all the questions 2 x 10 = 20marks)

<table>
<tr><th>Q. No.</th><th>Questions</th><th>CO</th><th>Skills</th></tr>
<tr><td>11.</td><td>Obtain an optimum economic schedule of a three generators for a total load of 900MW. The details of fuel cost functions are given below.
$F_1 = 392.7+5.544P_1+0.001093P_1^2$ $150<P_1<600$
$F_2 =217+5.495P_2+ 0.001358P_2^2$ $100<P_2<400$
$F_3 = 65.5+6.695P_3+0.004049P_3^2$ $50<P_1<200$</td><td>C402.4</td><td>U, A</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td>12.</td><td>Determine priority list using full load average production cost for the data given.
<table>
<tr><th rowspan="2">Unit. No</th><th colspan="2">Loading limits</th><th colspan="3">Fuel cost coefficients</th><th rowspan="2">cost</th></tr>
<tr><th>Min</th><th>Max</th><th>a_i</th><th>b_i</th><th>c_i</th></tr>
<tr><td>1</td><td>100</td><td>400</td><td>0.006</td><td>7</td><td>600</td><td>1.1</td></tr>
<tr><td>2</td><td>50</td><td>300</td><td>0.01</td><td>8</td><td>400</td><td>1.2</td></tr>
<tr><td>3</td><td>150</td><td>500</td><td>0.008</td><td>6</td><td>500</td><td>1.0</td></tr>
</table></td><td>C402.4</td><td>U, A</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>13.</td><td>Draw and explain the operation of SCADA with neat diagram.</td><td>C402.5</td><td>R, AZ</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td>14.</td><td>Draw and explain the various states and their transition</td><td>C402.5</td><td>R</td></tr>
</table>

Part – C

(Answer all the questions 1 x 10 = 10marks)

Q. No.	Questions	CO	Skills
15	The incremental costs of two units are : $\frac{dF_1}{dP_1} = 16 + 0.08P_1$ *Rs/MWhr* $\frac{dF_2}{dP_2} = 12 + 0.08P_2$ *Rs/MWhr* Power loss is given by $P_L = 0.001P_1^2 + 0.0024P_2^2 - 0.001P_1P_2$. Determine the optimum scheduling for a load demand of 100 MW.	C402.4	R, A
	or		
16	Determine the economic operation point for the three thermal units delivering a total load of 600MW without considering generator limit as well as with considering generator limit.	C402.4	U

	Given; **Unit 1: maximum output = 600MW, minimum output = 150MW** **The fuel cost function is $F_1(P_1) = 550+7.7\ P_1+0.00165\ P_1^2$Rs/hr** **Unit 2: coal fired : maximum output = 500MW, minimum output= 125MW** **The fuel cost function is $F_1(P_1) = 300+7.88\ P_2+0.002\ P_2^2$ Rs/hr** **Unit 3: coal fired : maximum output = 600MW, minimum output = 150MW** **The fuel cost function $F_3(P_3) =80+7.99\ P_3+0.005\ P_3^2$ Rs/hr**		

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned *against each question*

Staff Incharge: Dr.M.V.Suganyadevi, ASP/EEE, Mr.R.Satheesh, AP/EEE

Saranathan College of Engineering
Tiruchirappalli

Internal Assessment Test – III			Date/ Session	24/11/2021 & FN	Marks	50
Course code	EI8075	Course Title	Fibre Optics and Laser Instrumentation			
Batch No.		Duration	90 mins	Academic Year	2021 – 2022	
Year	IV	Semester/Section	VII / A&B	Department	EEE	

Part – A
(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1.	What are the Types of Trim	C404.4	E
2.	List the Advantages OF KEY HOLE melting	C404.4	R
3.	What is Conduction Limited Melting	C404.5	C
4.	What are the Types of LIDAR	C404.5	U
5.	List the applications of LIDAR	C404.5	U
6.	Write the Condition for Recording A Hologram,	C404.5	A
7.	Define Thermalisation	C404.6	R
8.	What is gynaecology and oncology?	C404.6	C
9.	List the Medical applications of lasers	C404.6	U
10.	Compare Holography with photography	C404.6	U

Part – B
(Answer all the questions 2 x 10= 20marks)

Q. No.	Questions	CO	Skills
11	What is Laser Welding? Discuss in detail about the Conduction Limited Melting and Key Hole Melting with neat diagram.	C404.4	A
	Or		
12	What are the Process of Laser Trimming? Explain detail then Construction, Working and Advantages of various laser Trimming.	C404.4	U
13	Explain in detail the Principle of Hologram Recording and the process involved in Reconstructing and viewing the holographic image.	C404.5	C
	Or		
14	Discuss in detail the Holography for non-destructive testing with neat diagram	C404.5	A
	Part – C **(Answer all the questions 1 x 10= 10marks)**		
15	Write a brief note on (1)laser Tissue Interactions and Photochemical reactions, (2)Thermalisation, (3)collisional relaxation	C404.6	R
	Or		
16	Write a detailed notes on Laser instruments for surgery and removal of tumors of vocal cards,	C404.6	A

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned eagainst each question

Faculty Name : Mr. Venugopal R, AP/EEE, Dr. M Marimuthu, AP/EEE

Saranathan College of Engineering
Tiruchirapalli

Unit Test			Date/ Session		Marks	50
Course code	EE8017	Course Title	HIGH VOLTAGE DIRECT CURRENT TRANSMISSION			
Batch No.		Duration	90 mins	Academic Year	2021-2022	
Year	IV	Semester/ Section	VIII / A&B	Department	EEE	

Part – A

(Answer all the questions 10 x 2 = 20marks)

Q. No.	Questions	CO	Skills
1	What are the factors to be considered for planning HVDC transmission?	C410.1	U
2	Distinguish between AC & DC transmission	C410.1	AZ
3	What are the types of power losses in thyristor?	C410.1	R
4	What is meant by pulse number?	C410.2	R
5	Define overlap and overlap angle.	C410.2	U
6	Draw the equivalent circuit of rectifier.	C410.2	R
7	What are the functions of higher level controller?	C410.3	R
8	What is the purpose of auxiliary controller in power controller?	C410.3	AZ
9	What are all the reasons the feedback control of power in a DC link?	C410.3	U
10	What are the modes of converter control characteristics?	C410.3	R

Part – B

(Answer all the questions 3 x 10 = 30marks)

Q.No.	Questions	CO	Skills
11	Explain the comparison of AC and DC transmission system.	C410.1	AZ
	or		
12	Explain modern trends in HVDC technology.	C410.1	R
13	Explain the choice of converter configuration for any pulse number	C410.2	AZ
	or		
14	Explain analysis of 12 pulse converter with bridge rectifier.	C410.2	AZ
15	Draw and explain three levels of control in VSC based HVDC.	C410.3	AZ
	or		
16	Explain Converter control characteristics.	C410.3	AZ

Bloom's Skills: Remember (R), Understand (U), Apply (A), Analyze (AZ), Evaluate (E) and Create (C). Skill need to be mentioned against each question

Faculty Name: Dr.S.Vijayalakshmi (A-Sec) & Mrs.N.Gayathri (B-Sec)