CMR TECHNICAL CAMPUS
UGC AUTONOMOUS
B. Tech. I Sem Supply End Examinations, January-2024
Basic Electrical & Electronics Engg
Common to   CE,ME,AIML,CSG,ECE,CSD

Time: 3 Hours   Max. Marks: 70

Note

i. This Question paper contains Part- A and Part- B.
ii. All the Questions in Part A are to be answered compulsorily.
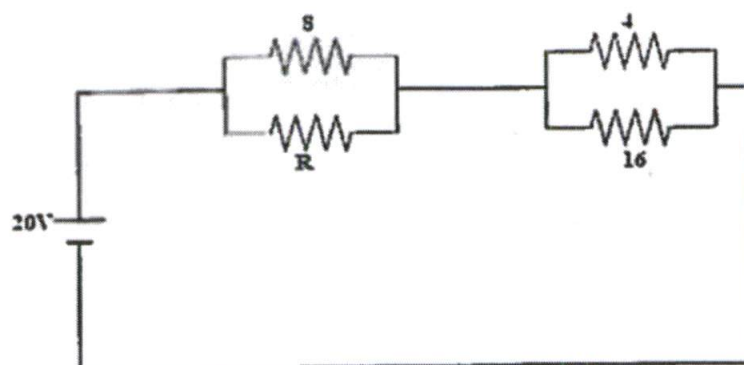iii. All Questions from Part B are to be answered with internal choice among them.

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PART-A

10 X 02 = 20 Marks

			Marks	CO	BL
1.	a	What are the expressions for peak and RMS values of a sinusoidal AC voltage waveform?	2	CO1	L2
	b	Explain the significance of power factor in a circuit .How to improve the power factor in a circuit ?	2	CO1	L3
	c	Enumerate the various components of a switchgear unit .	2	CO2	L2
	d	Explain Faraday's laws of electromagnetic induction	2	CO2	L2
	e	Define the torque expression for a DC motor .	2	CO3	L1
	f	Compare the armature voltage control and field flux control method of speed control of DC motor.	2	CO3	L2
	g	Outline the function of a half-wave rectifier, and what is the impact of using only one half-cycle of the AC waveform on the output?	2	CO4	L3
	h	In a real-world application, Select a component to optimize the design of a half-wave rectifier circuit to minimize ripple in the output voltage.	2	CO4	L6
	i	Explain the principle of operation of BJT	2	CO5	L2
	j	Compare the different configurations of BJT	2	CO5	L4

PART- B

5 X 10 = 50 Marks

			Marks	CO	BL
2.	a	Explain the current division rule and voltage division rule for series and parallel circuits	5	CO1	L2
	b	Total power dissipated in the circuit below is 40W.Solve for the value of R in Ohm. Assume all resistor values are in ohms.	5	CO1	L3

OR

3	a	Find the resistance of 1000 meters of copper wire 25 sq. mm in cross- section. What will be the resistance of another wire of material,3 times as long as and one half of cross-sectional area..	6	CO1	L3
	b	Discuss the significance of KCL and KVL in analyzing electrical circuits	4	CO1	L6
4	a	Explain about the various losses in a transformer.	6	CO2	L2
	b	The primary voltage of a single-phase transformer is 220 V, and the number of turns in the primary winding is 500. If the number of turns in the secondary winding is 100, calculate the secondary voltage	4	CO2	L2

OR

5	a	. Explain about O.C Test and SC Test with neat diagrams.	6	CO2	L3
	b	A transformer has an iron loss of 100 W and a full-load copper loss of 50 W. Evaluate the efficiency of the transformer when operating at full load with an output power of 500 W.	4	CO2	L5
6	a	What are the torque speed characteristics of different types of Dc motors. Enumerate and compare them	6	CO3	L2
	b	Explain the working principle of 3-Phase induction motor	4	CO3	L2

OR

7	a	A DC shunt motor has an armature resistance of 2 ohms and a field resistance of 250 ohms. If the rated armature current is 10 A, calculate the total voltage drop when the motor is running at full load.	5	CO3	L3
	b	Explain the torque slip characteristics of 3 phase induction motor .	5	CO3	L2
8	a	Describe the forward biased condition of a P-N junction diode with neat diagram	4	CO4	L2
	b	Develop the expression for ripple factor of a half wave diode rectifier circuit and then find its ripple factor .	6	CO4	L6

OR

9	a	For a forward-biased P-N junction diode, if the forward current is 20 mA and the diode voltage drop is 0.7 V, calculate the dynamic resistance	5	CO4	L6
	b	Summarize the advantages of a Full Wave Bridge Rectifier over a Half Wave Rectifier?	5	CO4	L5
10	a	Explain the construction of BJT in detail with neat diagrams	5	CO5	L3

	b	Explain how the transistor acts as an amplifier.	5	CO5	L3

<div align="center">OR</div>

11	a	The current gain (β) of a BJT is 100. If the base current is 20 μA, Analyze and find the collector current.	5	CO5	L4
	b	In a common emitter configuration of a BJT, if the input voltage is 1 V and the output voltage is 10 V, calculate the voltage gain	5	CO5	L3

CO   : Course Outcomes

BL   : Bloom's Taxonomy Levels   **L 1** : Remembering   **L 2** : Understanding

L 3 : Applying   **L 4** : Analysing

L 5 : Evaluating   **L 6** : Creating

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UGC AUTONOMOUS
B. Tech. II Sem Supply End Examinations, January-2024
Basic Electrical & Electronics Engineering
Common to CSE, IT & CSM

Time: 3 Hours   Max. Marks: 70

Note
i. This Question paper contains Part- A and Part- B.
ii. All the Questions in Part A are to be answered compulsorily.
iii. All Questions from Part B are to be answered with internal choice among them.

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PART-A

10 X 02 = 20 Marks

Q.No		Questions	Marks	CO	BL
		UNIT-I			
1.	a	Write the RMS and Average values of sine wave	2M	CO1	L1
	b	Define Reactive power of single phase AC supply	2M	CO1	L1
		UNIT-II			
	c	List out the Different types losses in a single phase Transformers	2M	CO2	L1
	d	What is the importance of electrical Earthing?	2M	CO2	L2
		UNIT-III			
	e	Give the classification of DC generators.	2M	CO3	L1
	f	An Induction motor never runs on Synchronous speed, why?	2M	CO3	L3
		UNIT-IV			
	g	Plot the Volt-Ampere Characteristics of PN junction diode.	2M	CO4	L4
	h	Write the applications of Zener diode.	2M	CO4	L1
		UNIT-V			
	i	Draw a construction of Silicon controlled rectifier (SCR)	2M	CO5	L1
	j	Define holding and latching current in a SCR.	2M	CO5	L2

PART- B

5 X 10 = 50 Marks

Q.No		Questions	Marks	CO	BL
		UNIT-I			
2.	a	Three resistances 5ohms, 8ohms and 9ohms are connected in series across 32 V supply. Find the total current drawn by the circuit and voltages across three resistors.	5M	CO1	L3
	b	Find Req at terminals a-b for the circuits in Fig. below:.	5M	CO1	L4
		OR			
3	a	Explain the analysis of RC series circuit with sinusoidal excitation	5M	CO1	L2
	b	A sinusoidal source (230 V, 50 Hz) feeds an inductive load which	5M	CO1	L4

		absorbs 8 A and 1000 W. Calculate the Power factor, Reactive power in the load.			
UNIT-II					

4	a	A 4 kVA, 200/400 V, 50 Hz, single-phase transformer gave the following test results:
		   OC test (LV side): 200 V, 0.8 A, 75 W
		   SC test (HV side): 20 V, 10 A, 90 W
		Calculate the parameters of the transformer referred to as LV side. Find the efficiency of the transformer for full load and half load both at 0.8 power factor lagging.
			10M	CO2	L5

OR					
5	a	Explain about the Switch fuse unit (SFU) and MCB	5M	CO2	L2
	b	Derive emf equation of single phase transformer.	5M	CO2	L1
UNIT-III					
6	a	Explain the principle of operation of DC Generator?	5M	CO3	L2
	b	A 250V, d.c. shunt motor takes a line current of 20A, resistance of shunt field winding is 200 ohm and resistance of the armature is 0.3 ohm. Find the armature current and back emf.	5M	CO3	L4
OR					
7	a	What are the factors that affect the speed of a D.C. motor explain in detail.	5M	CO3	L2
	b	A 3-phase, 6-pole induction motor is supplied from a 50Hz, 400V supply calculate i) The synchronous speed and ii) The speed of the rotor when slip is 4%.	5M	CO3	L3
UNIT-IV					
8	a	Explain how barrier potential is developed in a p-n junction diode.	5M	CO4	L2
	b	With the help of V-I Characteristics, explain the operation of a Zener Diode under forward and reverse bias conditions.	5M	CO4	L1
OR					
9	a	With a neat sketch Describe the operation of a full-wave rectifier.	5M	CO4	L1
	b	Discuss the behaviour of a PN diode under forward and reverse bias conditions for both DC and AC operating conditions.	5M	CO4	L2
UNIT-V					
10	a	With the help of static I-V characteristics, explain the operation of BJT in active, saturation, and cut off regions.	5M	CO5	L2
	b	With the help of neat circuit diagram, Explain Common Emitter input and output characteristics.	5M	CO5	L1
OR					
11	a	Compare the CE and CB configurations with respect to any four parameters.	5M	CO5	L2
	b	Draw and explain the Common Base input and output characteristics.	5M	CO5	L1

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                                        L 3 : Applying   L 4 : Analysing

                                        L 5 : Evaluating   L 6 : Creating

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