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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech. I Year I Semester Supplementary Examinations February-2024

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Six Units **6 X 10 = 60** Marks)

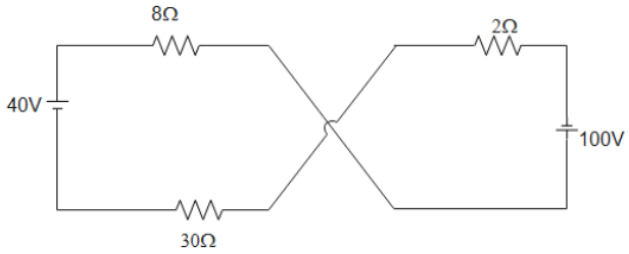
PART-A

UNIT-I

1	**a**	Write the derivation for equivalent resistance in series circuit.	**CO1**	**L3**	**5M**
	b	A 5ohm , 10 ohm ,20 ohm, resistors are connected in series across 120V DC supply calculates Total Resistance, Total current, Voltage drop across each resistor.	**CO1**	**L4**	**5M**

OR

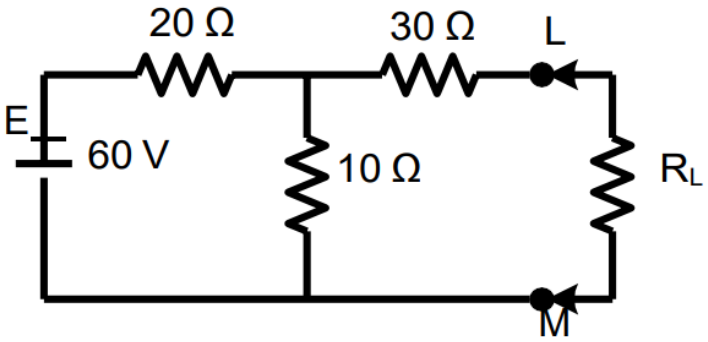
2	**a**	Find the voltage across 30 ohm resistor and current across 30 ohm resistor in the given circuit as shown below.	**CO1**	**L2**	**5M**



	b	Write the derivation of RMS Value of Alternating voltage.	**CO1**	**L3**	**5M**

UNIT-II

3		Determine the maximum power delivered to the load resistance RL.	**CO2**	**L3**	**10M**



OR

4	**a**	Explain Long Shunt Compound Generator and short shunt generator with neat diagram	**CO2**	**L3**	**5M**
	b	List the applications of different types of dc generators.	**CO2**	**L5**	**5M**

UNIT-III

5	**a**	Derive Torque equation of dc motor.	**CO3**	**L3**	**5M**
	b	The counter EMF of Shunt motor is 227 V. The field resistance is 160Ω and field current 1.5A. If the line current is 36.5A, find the armature resistance also find armature current when the motor is stationary.	**CO3**	**L5**	**5M**

OR

6	**a**	Explain the constructional details of transformer.	**CO3**	**L2**	**6M**
	b	A 20 kVA, 2000/200V, 50Hz transformer has 66 secondary turns. Calculate the number of primary turns and primary and secondary currents. Neglect losses.	**CO3**	**L4**	**4M**

PART-B

UNIT-IV

7	**a**	Explain the working of a PN junction diode under forward and reverse bias.	**CO5**	**L2**	**5M**
	b	Sketch the V-I Characteristics of a PN JunctionDiode.	**CO5**	**L3**	**5M**
		OR			
8	**a**	Explain the working principle of Bridge Rectifier with neat circuit diagram. Also draw its input and output waveforms.	**CO5**	**L2**	**5M**
	b	Explain the working principle of Full wave rectifier with a capacitor filter.	**CO5**	**L2**	**5M**

UNIT-V

9	**a**	What is a Bipolar junction Transistor? Mention its types.	**CO5**	**L1**	**5M**
	b	Discuss the operation of NPN transistor with neat schematic diagram.	**CO5**	**L2**	**5M**
		OR			
10	**a**	Derive the relationship between α, β and Υ of a Transistor.	**CO5**	**L3**	**5M**
	b	A transistor operating in CB configuration has I_C = 2.98mA, I_E = 3.00mA and I_{CO} =0.01mA Determine the current that will flow in the collector circuit when connected in CE configuration with a base current of 30μA.	**CO6**	**L3**	**5M**

UNIT-VI

11	**a**	With a neat diagram, explain the Transfer characteristics of N-channel JFET.	**CO5**	**L2**	**5M**
	b	Sketch the transfer characteristics of P-channel JFET.	**CO5**	**L3**	**5M**
		OR			
12	**a**	List the differences between N-channel JFET and P-channel JFET.	**CO5**	**L2**	**5M**
	b	Compare between CS, CG, CD configuration of JFET.	**CO5**	**L4**	**5M**

***** END *****