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(Revision- 2021)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER - 2023

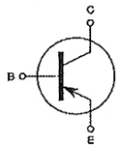
FUNDAMENTALS OF ELECTRICAL ENGINEERING

[Maximum Marks : 75] [Time : 3 hours]

PART–A

I. Answer **all** the following questions in one word or sentence. Each question carries 1 mark.

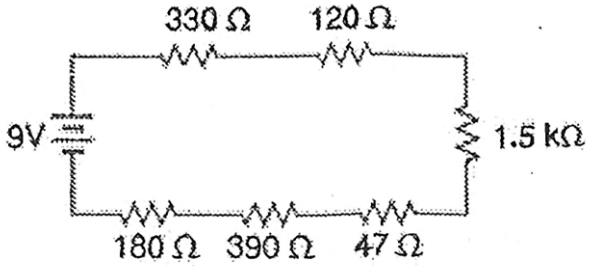
(9x1=9 marks)

		Module Outcome	Cognitive level
1	According to Ohm's law, Current through a conductor is directly proportional to……provided the physical conditions do not change.	M 1.02	R
2	The ratio of RMS value to average value of an alternating quantity is known as …….	M 1.03	R
3	In a …….motor field winding is connected in parallel with armature.	M2.01	U
4	List any two applications of single-phase induction motor.	M2.03	R
5	Recall any two applications of induction furnace.	M3.04	R
6	List three modes of heat transfer.	M3.03	U
7	Name any two active electronic components.	M4.01	R
8	Figure shows the symbol of  (a) PNP transistor (b) NPN transistor (c) SCR	M4.03	R
9	Write equation for effective resistance when two resistors R1 and R2 are connected in parallel.	M1.01	R

PART B

II. Answer **any Eight** questions from the following. Each question carries 3 marks.

(8x3=24)

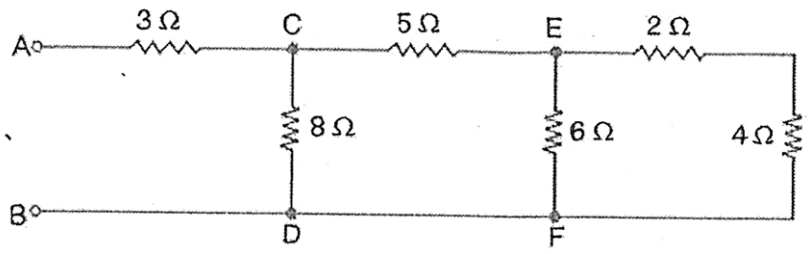
		Module Outcome	Cognitive level
1	Find current in the circuit. 	M1.02	A

2	State Faraday's laws of electromagnetic induction.	M1.03	R
3	Explain classifications of DC motors based on field connection.	M2.01	U
4	Discuss the principle of operation of three phase induction motors.	M2.02	U
5	Compare core type and shell type transformers with respect to limbs, flux distribution and arrangement of windings.	M3.01	U
6	Explain principle of dielectric heating.	M3.03	U
7	Draw circuit diagram of a full wave bridge rectifier circuit.	M4.02	U
8	Draw the block diagram of an electric drive.	M4.04	U
9	List six advantages of electric heating.	M3.03	R
10	Define power factor in AC circuit. Recall its maximum value.	M1.03	U

PART C

Answer **all** questions from the following. Each question carries 7 marks.

(6x7=42marks)

		Module Outcome	Cognitive level
III	A house supplied with 230 V, 50 Hz AC has 6 fans of 40W each working 6 hours daily, 6 lamps of 60W each working 5 hours daily, 5 lamps of 12 W each working for 2 hours, AC having 320W and a heater having 1200W working for 2 hours daily. Calculate the monthly cost of energy if the tariff is Rs. 2.5/unit. (take number of days as 30)	M1.04	A
	OR		
IV	Six resistors are connected as shown in Figure. If a battery having an EMF of 30 volts is connected to the terminals A and B, find (i) the current from the battery, (ii) voltage across 3 Ω resistor (iii) power dissipated in 3 ohm resistor. 	M1.02	A

V	Explain working of 3 Point starter with the help of neat diagram.	M2.04	U
	OR		
VI	Explain working of DOL starter with the help of neat diagram.	M2.04	U
VII	Explain principle of induction heating.	M3.03	U
	OR		
VIII	Explain the operation of arc furnace with the help of neat diagram.	M3.04	U
IX	Explain basic block diagram of EV charging system.	M4.04	U
	OR		
X	Outline the operation of chopper circuits.	M4.03	U
XI	Draw 3 phase star and delta connection with line and phase voltages and currents. Write the relation between line and phase values of voltage and current.	M1.02	U
	OR		
XII	Define (i) RMS value (ii) Average value (iii) Form factor of an alternating quantity.	M1.03	U
XIII	Summarize the constructional details of a single phase induction motor.	M2.03	U
	OR		
XIV	Explain the constructional details of a three phase induction motor.	M2.02	U

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