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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2025

FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING

[Maximum marks: 75] [Time: 3 Hours]

PART A

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

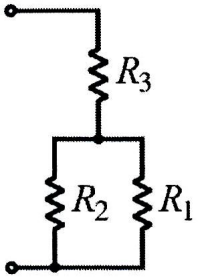
(9 x 1 = 9 Marks)

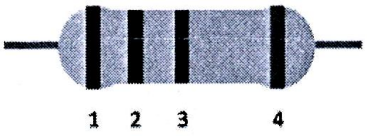
		Module outcome	Cognitive level
1	Match the following (a) Angular velocity (A) Ohm (b) Time period (B) Rad/s (c) Frequency (C) Sec (d) Impedance (D) Hz	M1.04	R
2	The SI unit of voltage is ……..	M1.01	R
3	Write the general expression for alternating voltage.	M1.03	R
4	The expanded form of MCB is …….	M2.01	R
5	Give the expression for active power in a three phase ac circuit.	M2.02	R
6	Draw the symbol of variable resistor.	M3.01	R
7	Define turns ratio of a transformer.	M3.04	R
8	Draw the symbol of Zener diode.	M4.02	R
9	List any 2 applications of PN junction diode.	M4.01	R

PART B

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

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	An alternating voltage is represented by the expression, V = 25 Sin 628 t. Find amplitude and angular frequency	M1.04	A
2	Define and give SI units for the following terms: (a) Current (b) Resistance	M1.01	R
3	Calculate the equivalent resistance of the following circuit if R1=R2 = 4 Ohm and R3 = 3 ohm 	M1.02	A

4	Explain with a diagram how an alternating voltage is generated in a coil when it is rotated within in a magnetic field.	M1.03	U
5	Differentiate between fuse and MCB. (Write any three points)	M2.01	U
6	A number 333 is typed on the body of a capacitor. Find out the actual capacitance value.	M3.02	A
7	 Band 1 colour = Red; Band 2 colour = Green Band 3 colour = Brown; Band 4 colour = Gold Calculate the resistance of the given resistor.	M3.01	A
8	Define self and mutual inductance.	M3.03	R
9	Define step up and step down transformer.	M3.04	R
10	Write the truth table of AND Gate.	M4.04	R

PART C

Answer all questions. Each question carries seven marks.

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Derive the equation for effective resistance when the resistors R1 and R2 are connected in (a) Series (b) Parallel	M1.02	U
	OR		
IV	Explain Faraday's law of electromagnetic induction.	M1.03	U
V	In a residential house following loads are connected. The cost of energy is Rs.2 per unit. Calculate. (a) Daily energy consumption in commercial units of energy. (b) The electricity bill for the month of December.	M2.03	A

Sl.No	Item	Wattage	Nos	Daily operating hours
a	Lamp	40	10	5
b	Fan	60	5	10
c	Heater	1000	1	2
d	Refrigerator	250	1	20

VI	**OR** In a circuit, the applied voltage is 100 V and is found to lag the current of 10 A by 30 degrees. Determine (a) Power factor of the circuit. (b) Active power (c) Reactive power	M2.02	A
VII	State the purpose of following accessories used in electrical connection. (a) Energy meter (b) ELCB (c) Main switch **OR**	M2.01	R
VIII	List any seven general safety precautions to be followed while working with electricity.	M2.04	R
IX	Explain the colour coding of resistors. **OR**	M3.01	U
X	Derive the effective capacitance of a circuit with two equal capacitors connected in series.	M3.02	U
XI	Draw the circuit of a full wave bridge rectifier circuit and explain its operation with waveforms. **OR**	M4.01	U
XII	Describe the characteristics of zener diode with a neat diagram.	M4.02	U
XIII	Describe the circuit for amplification of a signal using NPN transistor. **OR**	M4.03	U
XIV	Draw the symbol and write the truth table of following logic gates. (a) NAND gate (b) XOR gate	M4.04	U

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