

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE, APRIL - 2024**

**FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS**

[Maximum Marks:75]

[Time: 3 Hours]

**PART - A**

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

**( 9 x 1 = 9 Marks)**

Module Outcome Cognitive level

1	Match the following. (A) Resistance : (a) ohms (B) Power : (b) watts (c) volts	M1.01	R
2	Define the term electromagnetic induction.	M1.03	R
3	The maximum value of an alternating quantity is called .....	M1.04	R
4	Expansion of MCB is .....	M2.01	R
5	The expression for reactive power in a single phase ac circuit is .....	M2.02	R
6	Define Self-inductance.	M3.03	R
7	List any two applications of transformer.	M3.04	R
8	Draw the symbol of a PN junction diode and show the current direction in the forward biased condition.	M4.01	R
9	..... diode is commonly used in voltage regulators.	M4.02	R

### PART - B

II. Answer *any eight* questions from the following. Each question carries 'Three' marks.

( 8 x 3 = 24 Marks)

Module Outcome Cognitive level

1	State the laws of resistance.	M1.01	R
2	Compare a series circuit and parallel circuit. ( Write any three points).	M1.02	U
3	State Faraday's laws of electromagnetic Induction.	M1.03	R
4	Define the terms a) Inductive Reactance (b) Impedance.	M1.04	R
5	Define the following with respect to a single phase ac circuit. (a) Power factor (b) Active Power	M2.02	R
6	Define (a) Active components (b) Passive components with examples.	M3.01	R
7	List the applications of capacitors . (any three points)	M3.02	R
8	Explain the classification of inductors.	M3.03	U
9	Explain the working principle of a transformer.	M3.04	U
10	Write the symbol and truth table of XOR gate.	M4.04	R

### PART - C

Answer all the questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

Module Outcome Cognitive level

III.	a) State Ohm's Law. b) A resistor connected to a 240V supply draws a current of 16mA. Determine its resistance value and the actual power consumed.	M1.01	A
IV.	<p style="text-align: center;"><b>OR</b></p> Compute the effective resistance and total current when three resistances of 6Ω, 10Ω and 20Ω are connected in (a) Series (b) Parallel across a 100V dc supply.	M1.02	A
V.	A small scale industry has the following connected load. Calculate the monthly electricity bill at the rate of ₹5 per unit. (a) 10 LED tubes of 20W each working 12hrs per day. (b) 4 coolers of 100W each working 4hrs per day. (c) 10 fans of 80W each working 8hrs per day. (d) A 1500W electric oven working 6hrs per day.	M2.03	A

	<b>OR</b>		
VI.	A resistor of $50\Omega$ and an inductor of 0.1 H are connected in series across a 200V, 50Hz ac supply. Calculate the impedance, power factor, Current, active power and reactive power.	M2.02	A
VII.	Summarize the general safety precautions to be adopted while dealing with electricity ( Write any seven points)	M2.04	U
	<b>OR</b>		
VIII.	Specify the purpose of the following used in electrical wiring systems. a) Service mains b) Cut out fuse c) MCB d) Neutral Link	M2.01	U
IX.	Explain the constructional details of a Carbon composition resistor with a neat diagram.	M3.01	U
	<b>OR</b>		
X.	Explain the charging and discharging of a capacitor.	M3.02	U
XI.	Illustrate the working of a centre tapped full wave rectifier with relevant waveforms.	M4.01	U
	<b>OR</b>		
XII.	Explain the working of an NPN transistor with a neat diagram.	M4.03	U
XIII.	Draw the symbols and write the truth tables of universal gates.	M4.04	U
	<b>OR</b>		
XIV.	Explain the working of a Zener diode with a neat diagram.	M4.02	U

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