TED (21) 2031 (Revision - 2021)

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

2106220064B

FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING

[Maximum marks: 75]

PART A

I. Answer all the following questions in one word or one sentence. Each question carries 1 mark. $(9 \times 1 = 9 \text{ Marks})$

Module outcomeModule outcomeCo outcome1Match the followingM1.04(a) Angular velocity(A) Ohm(b) Time period(B) Rad/s(c) Frequency(C) Sec(d) Impedance(D) Hz2The SI unit of voltage is3Write the general expression for alternating voltage.4The expanded form of MCB is5Give the expression for active power in a three phase ac circuit.6Draw the symbol of variable resistor.7Define turns ratio of a transformer.8Draw the symbol of Zener diode.9List any 2 applications of PN junction diode.						> 111ai K5j
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8Draw the symbol of Zener diode.M4.029List any 2 applications of PN junction diode.M4.01	7	Define turns ratio of a transformer.			M3.04	R
9 List any 2 applications of PN junction diode. M4.01	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. (Q v 2

		$(8 \times 3 = 2)$	24 Marks)
		Module outcome	Cognitive level
1	An alternating voltage is represented by the expression,	M1.04	А
	V = 25 Sin 628 t. Find amplitude and angular frequency		
2	Define and give SI units for the following terms:	M1.01	R
	(a) Current (b) Resistance		
3	Calculate the equivalent resistance of the following circuit if	M1.02	А
	R1=R2 = 4 Ohm and R3 = 3 ohm R_{3} R_{2} R_{1}		

Reg.No.....

[Time: 3 Hours]

Signature.....

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	M3.02	А
	actual capacitance value.		
7		M3.01	А
	* 6 3 *		
	Band 1 colour = Red; Band 2 colour = Green		
	Band 3 colour = Brown; Band 4 colour = Gold		
	Calculate the resistance of the given resistor.		
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.

						$(6 \times 7 = 4)$	2 Marks)
						Module	Cognitive
						outcome	level
III	Derive the	e equation for effect	ive resistat	nce whe	n the resistors R1	M1.02	U
	and R2 are	e connected in					
	(a) Ser	ries					
	(b) Par	rallel					
			OR				
IV	Explain Fa	Explain Faraday's law of electromagnetic induction.			M1.03	U	
V	In a residential house following loads are connected. The cost of				M2.03	А	
	energy is I	energy is Rs.2 per unit. Calculate.					
	(a) Da	(a) Deiles en energy a manuficar in communical surity of en energy					
	(a) Da	(a) Daily energy consumption in commercial units of energy.					
	(0) 11	(b) The electricity bill for the month of December.					
					Daily		
	Sl.No	Item	Wattage	Nos	operating		
					hours		
	а	Lamp	40	10	5		
	b	Fan	60	5	10		
	с	Heater	1000	1	2		
	d	Refrigerator	250	1	20		
		·	•				

OR	M2.02	А			
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					
State the purpose of following accessories used in electrical	M2.01	R			
connection.					
(a) Energy meter					
(b) ELCB					
(c) Main switch					
OR					
List any seven general safety precautions to be followed while	M2.04	R			
working with electricity.					
Explain the colour coding of resistors.	M3.01	U			
OR					
Derive the effective capacitance of a circuit with two equal	M3.02	U			
capacitors connected in series.					
Draw the circuit of a full wave bridge rectifier circuit and explain its	M4.01	U			
operation with waveforms.					
OR					
Describe the characteristics of zener diode with a neat diagram.	M4.02	U			
Describe the circuit for amplification of a signal using NPN	M4.03	U			
transistor.					
OR					
Draw the symbol and write the truth table of following logic gates.	M4.04	U			
(a) NAND gate (b) XOR gate					
	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 State the purpose of following accessories used in electrical connection. (a) Energy meter (b) ELCB (c) Main switch OR List any seven general safety precautions to be followed while working with electricity. Explain the colour coding of resistors. OR Derive the effective capacitance of a circuit with two equal capacitors connected in series. Draw the circuit of a full wave bridge rectifier circuit and explain its operation with waveforms. OR Describe the characteristics of zener diode with a neat diagram. Describe the circuit for amplification of a signal using NPN transistor. (a) NAND gate (b) XOR gate	OR M2.02 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 M2.01 State the purpose of following accessories used in electrical connection. (a) Energy meter (b) ELCB (c) Main switch OR M2.04 List any seven general safety precautions to be followed while working with electricity. M2.04 Explain the colour coding of resistors. M3.01 OR M3.02 capacitors connected in series. M3.02 Draw the circuit of a full wave bridge rectifier circuit and explain its operation with waveforms. M4.01 Describe the characteristics of zener diode with a neat diagram. M4.02 Describe the circuit for amplification of a signal using NPN it ansistor. M4.03 OR Draw the symbol and write the truth table of following logic gates. (a) NAND gate (b) XOR gate			
