



# VIT

Vellore Institute of Technology  
(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.: 21BME0709

## SCHOOL OF ELECTRICAL ENGINEERING CONTINUOUS ASSESSMENT TEST - II WINTER SEMESTER 2024-2025

SLOT: E2+TE2

**Programme Name & Branch** : B.Tech BME/ BMM/ BMV  
**Course Code and Course Name** : BEEE102L - Basic Electrical and Electronics Engineering  
**Faculty Name(s)** : Dr. Dhanamjayulu C, Dr. Arun N, Dr. Mageshvaran R,  
 Dr. Subramanian K, Dr. Satyajit Mohanty, Dr. Gayathri V  
**Class Number(s)** : VL2024250504489/490/491/93/95  
**Exam Duration : 90 minutes**      **Date of Exam: 20-3-2025**      **Maximum Marks: 50**

**General instruction(s):** Answer All Questions

- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes :  
CO2- Comprehend the parameters of magnetic circuits; CO4- Design basic combinational circuits in digital system

Q. No	Question	M	CO	BL
1.	Do the following conversions i. $(1234)_8$ to hexadecimal number ii. $(543)_{16}$ to octal number iii. $(777.888)_{16}$ to binary number iv. $(1110101011.1001010)_2$ to octal number v. $(4.56)_{10}$ to hexadecimal number	10	CO4	BL3
2.	Obtain the simplified logical expression using 'K' map for the following min terms: $m_0, m_1, m_2, m_7, m_8, m_9, m_{10}, m_{11}, m_{13}$ . Also draw the logical circuit diagram.	10	CO4	BL3
3.	A) Derive the truth table for the logical expression $Y = A + BC + D$ .	5	CO4	BL3
	B) Derive the logical expression of Exclusive-NOR (XNOR) gate and implement it using any one of the universal gates.	5		
4.	An iron ring with a cross sectional area of 8 cm and a mean circumference of 120 cm is wound with 480 turns of wire carrying a current of 2 A. The relative permeability of the ring is 1250. Calculate the flux established in the ring.	10	CO2	BL3
5.	Find the current, I, required to establish a flux $\phi = 2.4 \times 10^{-4}$ Wb in the magnetic circuit of the following figure. Here, Area = $2 \times 10^{-4} \text{ m}^2$ , $l_{ab} = l_{ef} = 0.05 \text{ m}$ , $l_{af} = l_{be} = 0.02 \text{ m}$ , $l_{bc} = l_{de}$ , and the material is sheet steel with relative permeability equal to 4000. Also, find the inductance. What happens to the value of inductance and current if the air gap is replaced by the sheet steel?	10	CO2	BL3

