



VIT

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

REG.NO

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

SLOT: A2

Programme Name & Branch : B. Tech (CSE & IT)
Course Code and Course Name : BEEE102L
Faculty Name(s) : JAYANANDAN T, VIJAYA PRIYA P, ANBARASAN P, WASHIMA TASNIN, SONAM SHRIVASTAVA, MUKUL CHANKAYA, ARUN N, SARIGAMALA KARTHIK KIRAN, GAYATHRI V, KALAISELVAN N, CHITRA A, MRUTUNJAYA PANDA, SANTANU KUMAR DASH, HIMADRI LALA, NAFEES AHMED
Class Number(s) : VL2024250106423, VL2024250106424, VL2024250106426, VL2024250106427, VL2024250106446, VL2024250106447, VL2024250106448, VL2024250106562, VL2024250106564, VL2024250106646, VL2024250106648, VL2024250106971, VL2024250107071, VL2024250107111, VL2024250109148

Date of Examination : 13/10/2024

Exam Duration : 90 minutes

Maximum Marks: 50

General instruction(s):

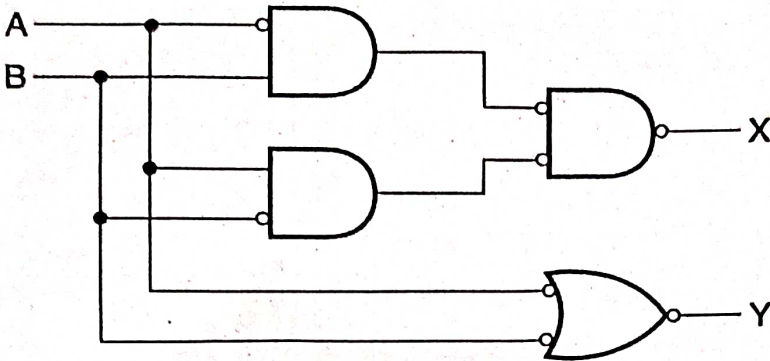
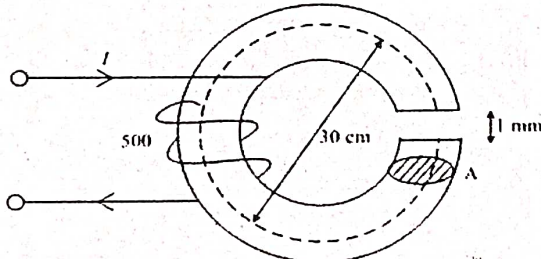
- Answer All Questions

Q. No	Questions	Marks
1.	Simplify the below digital function using Boolean algebra and implement the reduced expression with NAND gates. $Y = \overline{A}C + ABC + \overline{A}BC + AB + D$	10
2.	a. Obtain the Boolean expression for the circuit shown in Fig.1 (2 marks) b. Bring the Boolean expression to canonical form (3 marks) c. Minimize the obtained expression using K-Map and design the logic circuit with minimum number of gates. (3+2 marks) <div style="text-align: center;"> </div>	10

Fig. 1



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3.	<p>a. The logic diagram of Fig. 2 performs the function of a very common arithmetic building block. Identify the logic function.</p>  <p style="text-align: center;">Fig. 2</p>	5
	<p>b. What is a data selector? Give the detailed logical implementation of a data selector with 4 inputs with necessary logic circuit and truth table.</p>	5
4.	<p>A ring of 30-cm mean diameter is made using a cylindrical iron rod of diameter 2.5 cm as shown in Fig. 3. A saw-cut 1-mm wide is made through the ring to create an air-gap. A coil with 500 turns of wire is wound on the ring. Calculate the current required in the exciting coil to produce a flux of 4 mWb in the ring. Assume the relative permeability of iron at this flux density as 800. Neglect any leakage or fringing of the magnetic field.</p>  <p style="text-align: center;">Fig. 3</p>	10
5.	<p>The total inductance of two coils, A and B, when connected in series, is 0.5 H or 0.2 H, depending on the relative directions of the current in the coils. Coil A, when isolated from coil B, has a self-inductance of 0.2 H. Calculate</p> <ul style="list-style-type: none"> (a) the mutual inductance between the two coils (b) the self-inductance of coil B (c) the coupling factor between the coils. (d) the two possible values of the induced e.m.f. in coil A when the current is decreasing at 1000 ampere per second 	10
