VIT

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

REG.NO.: 24BCE2777

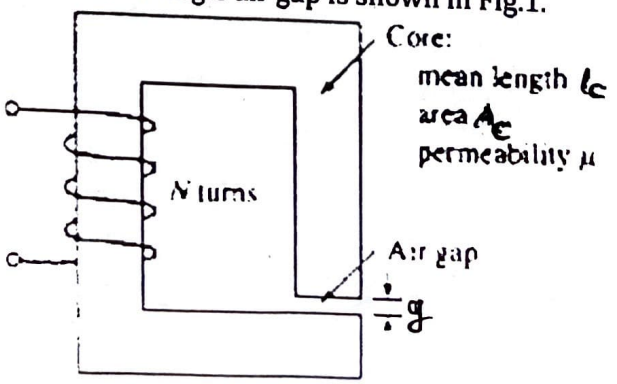
SCHOOL OF ELECTRICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2024-2025

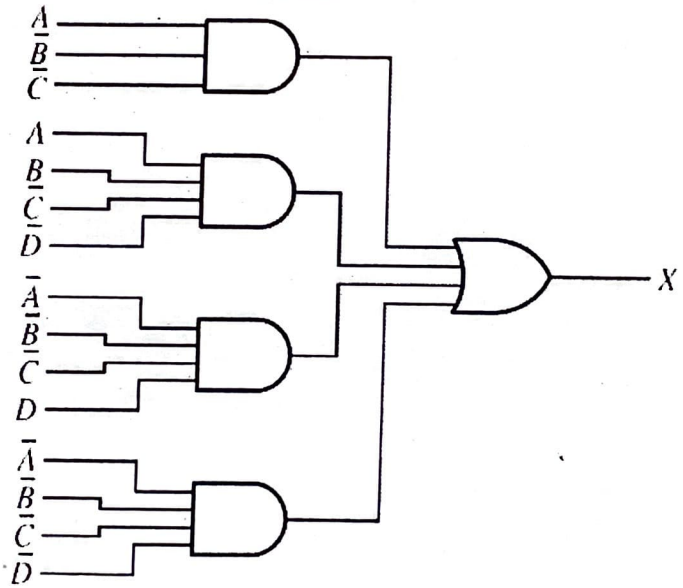
SLOT: C2+TC2

Programme Name & Branch : **B.Tech in Computer Science and Engineering**
Course Code and Course Name : **BEEE102L - Basic Electrical and Electronics Engineering**
Faculty Name(s) : Meikandasivam S, Rama Prabha D, Thamilmaran A, Arunkumar G, Yeddula Pedda Obulesu, Jakeer Hussain, Suprava Chakraborty, Rashmi Ranjan Das, Razia Sultana W, Arun S L, Anusuya Bhatacharyya, Satyajit Mohanty, Vinoth K
Class Number(s) : VL2024250106425, VL2024250106434, VL2024250106435, VL2024250106436, VL2024250106437, VL2024250106438, VL2024250106439, VL2024250106926, VL2024250106956, VL2024250106993, VL2024250107051, VL2024250107057, VL2024250109164
Date of Examination : **15-10-2024**
Exam Duration : **90 minutes** **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
  CO1 Evaluate DC and AC circuit parameters using various laws and theorems
  CO2 Comprehend the parameters of magnetic circuits
  CO4 Design basic combinational circuits in digital system

Q. No	Question	M	CO	BL
1.	A balanced three-phase star-connected load is connected across a 400 V, 50 Hz, three-phase supply. The current per phase is 20∠-36° A. The total active power taken by the load is 10.5 kW. Determine, (a) the resistance and inductance of the load, (b) the reactive power absorbed by the load, (c) the apparent power taken by the load.	10	1	4
2.	A) The total inductance of two coils connected in series cumulatively is 18 H and connected differentially 10 H. The self-inductance of one coil is 12 H. Calculate, (a) the mutual inductance (b) the coupling coefficient	5	2	3
	B) A magnetic circuit with a single air gap is shown in Fig.1.  Fig. 1	5	2	3

	The core dimensions are: Core-sectional area = 18 cm^2 Mean core length, lc = 45 cm Air gap length, g = 0.46 cm Assume N = 400 turns Assume that the core is of infinite permeability and neglects the effects of fringing fields at the air gap and leakage flux. (a) Calculate the core and the airgap's reluctance. (b) Assume a current of I = 0.2 A and calculate the flux.			
3.	A toroidal air-cored coil with 2000 turns has a mean radius of 25 cm, with the diameter of each turn being 6 cm. If the current in the coil is 10 A, find MMF, flux, and flux density.	10	2	3
4.	Minimize the combinational logic circuit shown in the below Figure. Inverters for the complemented variables are not shown. Also, sketch the reduced diagram using universal gates. (Hint: use k-map to reduce the Boolean expression)  Fig. 2	10	4	4
5.	Convert the following: a) Decimal to binary: $(32.625)_{10}$ b) Decimal to octal: $(1985.45)_{10}$ c) Octal to decimal: $(63.456)_8$ d) Hexa-decimal to octal: $(F7D9)_{16}$ e) Hexa-decimal to decimal: $(ABCD.EF)_{16}$ (Note: Manual conversion procedure is mandatory)	10	4	3

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