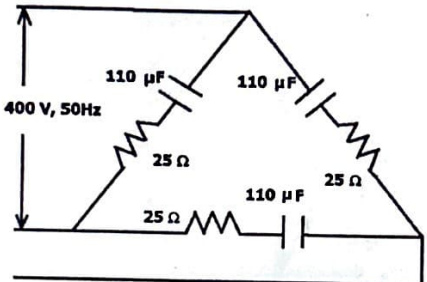
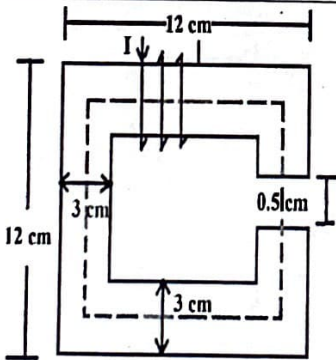


**SCHOOL OF ELECTRICAL ENGINEERING  
CONTINUOUS ASSESSMENT TEST - II  
FALL SEMESTER 2024-2025**

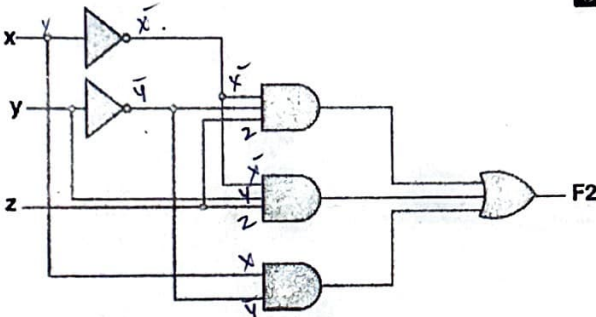
**Programme Name & Branch** : B.Tech- EEE  
**Course Code and Course Name** : Basic Electrical and Electronics Engg. - BEEE102L  
**Faculty Name(s)** : Dr. I. Jacob Raglend, Dr. S. Prabhakar K, Dr. Anusuya  
**Class Number(s)** : VL2024250105963/5961/5962  
**Date of Examination** : 16<sup>th</sup> October 2024, AN  
**Exam Duration** : 90 minutes **Maximum Marks: 50**

**General instruction(s):**

- Answer All Questions. Assumptions can be made wherever necessary
- 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	 <p style="text-align: center;">Figure 1</p> <p>Determine the line and phase voltage, line and phase current of the three-phase load shown in figure 1. What is the power factor of the circuit? If three identical chokes of <math>5 + 15j</math> impedance are inserted in series, one in each limb of the load, compute the line and phase currents and power factor of the new load?</p>	10	CO1	BL2
2	 <p style="text-align: center;">Figure 2</p> <p>The magnetic core in figure 2 has a cross-sectional area of <math>3 \times 3 \text{ cm}^2</math>. If the source <math>I</math> can produce a maximum of 3 A current, compute the number of turns required to get a flux density of 0.6 T in the core. The relative permeability of the core is 5000.</p>	10	CO2	BL3



3.	<p>The mutual inductance between two similar inductors connected one way is 0.2 H. When you reverse one of the inductors, the total inductance is 1.8 H which is higher than the total inductance in the earlier case. Deduce the total value of inductance in the earlier case. Further, find the k factor of the coil. What is your inference on the coupling coefficient value obtained?</p>	10	CO2	BL4																				
4.	<p>a) Find the equivalent numbers in the other bases for the numbers shown in table 1.</p> <table border="1" data-bbox="480 495 936 781"> <thead> <tr> <th>Decimal</th> <th>Octal</th> <th>Binary</th> <th>Hexadecimal</th> </tr> </thead> <tbody> <tr> <td>108.27</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>721.44</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>101101.101</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>FA.A2</td> </tr> </tbody> </table> <p style="text-align: center;">Table 1</p>	Decimal	Octal	Binary	Hexadecimal	108.27					721.44					101101.101					FA.A2	5	CO4	BL2
Decimal	Octal	Binary	Hexadecimal																					
108.27																								
	721.44																							
		101101.101																						
			FA.A2																					
	<p>b) Find the output expression (F2) corresponding to the circuit (refer figure 3) and <i>minimize</i> it. Redraw the gates of the minimized expression.</p>  <p style="text-align: center;">Figure 3</p>	5	CO4	BL3																				
5.	<p>Minimize the following Boolean function with a K map.</p> $F(A, B, C, D) = \sum m(4, 5, 7, 9, 11, 13, 14, 15)$	10	CO4	BL3																				

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