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

REG.NO.: 24BVD0214

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

SLOT:A1+TA1

Programme Name & Branch	**:B Tech, (ECE, VLSI)**
Course Code and Course Name	**: BEEE102L, Basic Electrical and Electronics Engineering**
Faculty Name(s)	: Dr. Kathirvelan J, Dr Somasundaram D, Dr Sagar, Dr Vaegae Naveen kumar, Dr V Velmurugan
Class Number(s)	: 8645, 6516, 6521, 6515, 6506
Date of Examination	: 13-10-2024
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
  CO 1. Evaluate DC and AC circuit parameters using various laws and theorems
  CO 2. Comprehend the parameters of magnetic circuits
  CO 4. Design basic combinational circuits in digital system

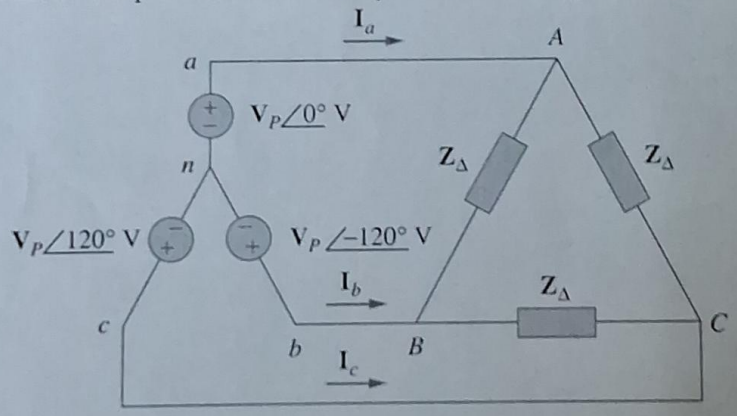
<table>
<tr><th>Q. No</th><th>Question</th><th>M</th><th>CO</th><th>BL</th></tr>
<tr><td>1.</td><td>In the balanced three-phase wye-delta circuit in figure 1, determine the line currents and phase currents. Take $V_P = 150\ V$ and $Z_\Delta = 36\angle 45°\ \Omega$.
 

Figure 1</td><td>10</td><td>1</td><td>BL3</td></tr>
<tr><td>2.</td><td>a). 2's complement representation of a 16-bit number (one sign bit and 15 magnitude bits) is FFFI. Its magnitude in decimal representation is _____</td><td>2</td><td>4</td><td>BL3</td></tr>
<tr><td></td><td>b). Match the List I and List II
<table>
<tr><th colspan="2">List I (Binary)</th><th colspan="2">List – II(Hexadecimal)</th></tr>
<tr><td>A</td><td>10101010</td><td>1.</td><td>FF</td></tr>
<tr><td>B</td><td>11111111</td><td>2.</td><td>88</td></tr>
<tr><td>C</td><td>10001000</td><td>3.</td><td>92</td></tr>
<tr><td>D</td><td>10010010</td><td>4.</td><td>AA</td></tr>
</table></td><td>4</td><td></td><td></td></tr>
</table>

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	a). Carryout the following conversion, (i) Add $(-6)_{10}$ to $(+15)_{10}$. Use eight bits (byte) to represent the signed numbers. (ii) Add $(-15)_{10}$ to $(+6)_{10}$. Use eight bits (byte) to represent the signed numbers.	4		
3.	a) Express the given Boolean expression $Y = \overline{A} + B\overline{C}$ in standard canonical SOP form.	4	4	BL3
	b) Simplify the given functions using Boolean algebra and implement the same with the basic logic gates. $\overline{A}BC + A\overline{B}C + AB\overline{C} + ABC$	6		
4.	Simplify the following Boolean expression using the 4-variable K-map. $F(A,B,C,D)=\sum m(2,3,6,7,8,10,13,15)$	10	4	BL3
5.	An iron ring with a cross-sectional area of 3 cm^2 and a mean circumference of 15 cm is wound with 250 turns of wire carrying a current of 0.3 A. The relative permeability of the ring is 1500. i) Calculate the flux established in the ring. ii) If a saw cut of width 2 mm is made in the above ring, find the new value of the flux in the circuit.	10	2	BL3