University of Information Technology & Sciences (UITS)
Faculty of Science and Engineering
Department of Computer Science and Engineering
Program: B.Sc. in CSE
Term Final Examination, Autumn 2025
Course Title: Fundamental of Electrical Engineering
Course Code: EEE 0713121

Marks: 50   **Time: 3 *(Three)* hours**

(Answer all questions)

Q. No.	Questions	Marks

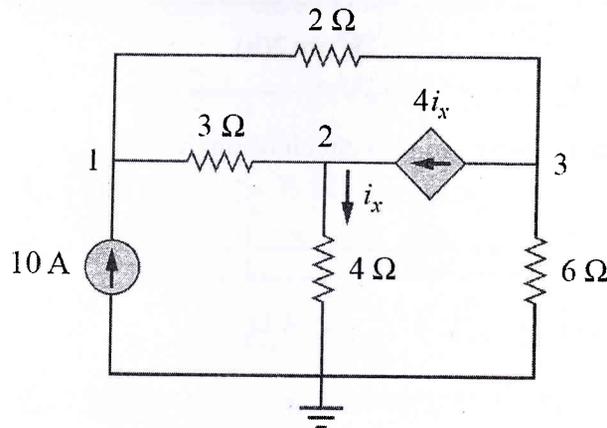1. a) Find the voltages at the three non-reference nodes in the circuit of figure 1(a) using Nodal analysis.   [06]

Figure 1(a)

   b) Evaluate the condition for maximum power transfer in a DC circuit.   [04]

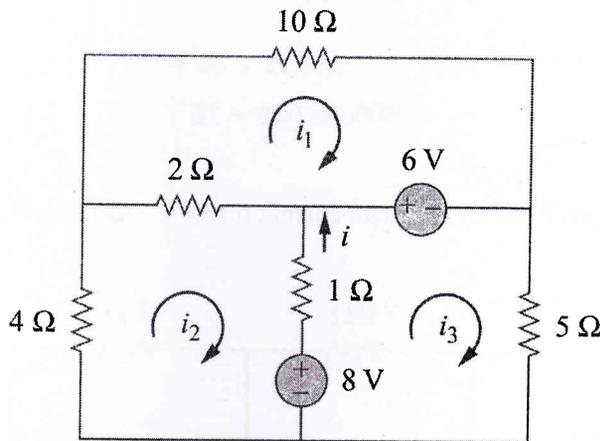2. a) Apply mesh analysis to calculate i in the circuit of figure 2(a).   [04]

Figure 2(a)

b) State Superposition Theorem. Determine v_0 in the circuit of figure 2(b) using the [06] Superposition principle.
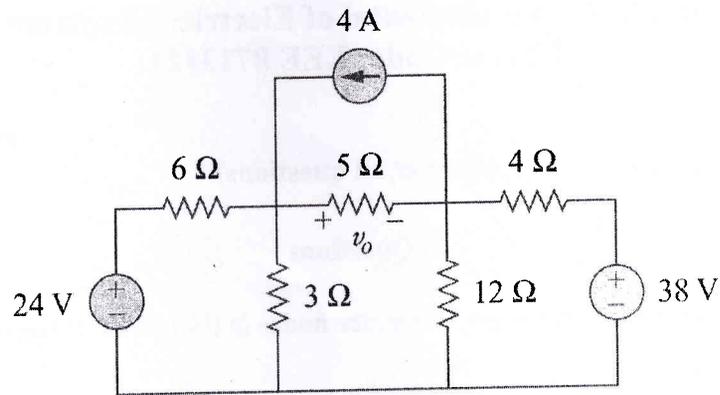

Figure 2(b)

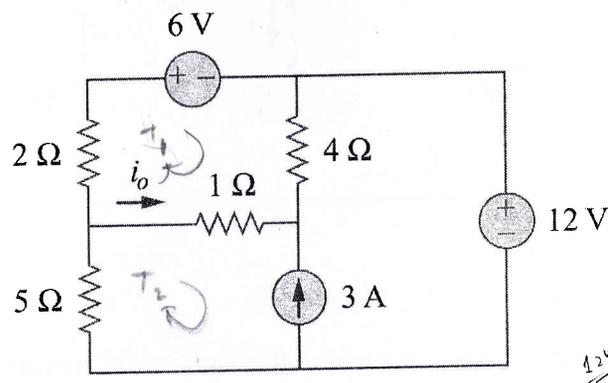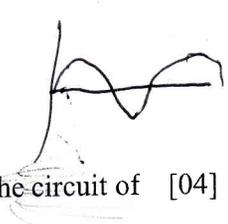3. a) Use mesh analysis to obtain i_0 in the circuit of figure 3(a). [06]

Figure 3(a)

b) Compute the phase angle between the following sinusoids and state which one lags [04] the other.

$$v_1 = 20 \ sin \ (wt + 60°)$$
$$v_2 = 60 \ cos \ (wt - 10°)$$

4. a) Use Source Transformation to calculate current through 8 Ω resistor in the circuit of [04] figure 4(a).
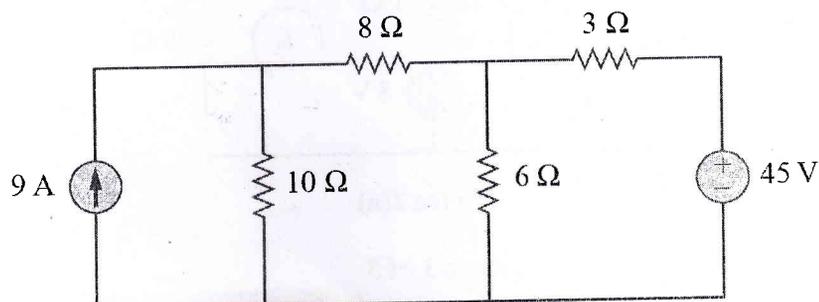

Figure 4(a)

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b) State Thevenin's Theorem. Apply Thevenin's theorem to find V_0 in the circuit of figure 4(b). [06]
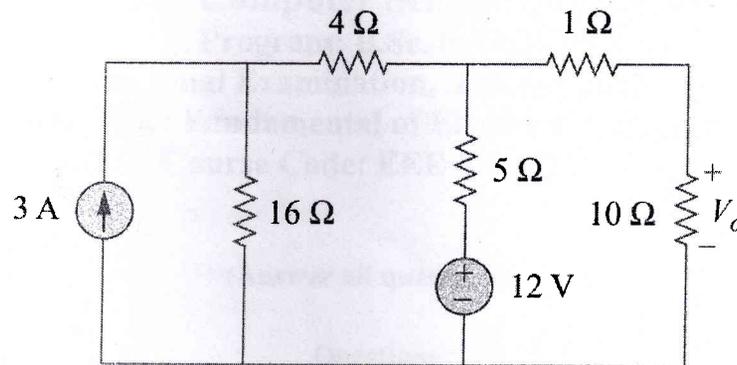

Figure 4(b)

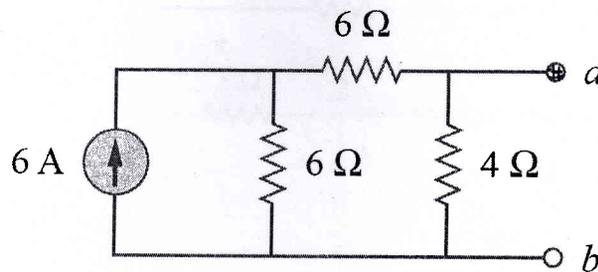5. a) Determine the Norton equivalent at the terminals a-b of the circuit in figure 5(a). [05]

Figure 5(a)

b) Let $i_s(t) = 5\ cos\ (100t + 40°)$ A. Solve for v_x in the circuit of figure 5(b). [05]
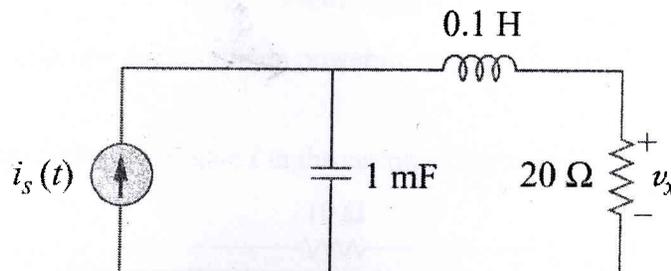

Figure 5(b)