Name:.....
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MAR ATHANASIUS COLLEGE OF ENGINEERING
KOTHAMANGALAM – 686666
(Govt. Aided Autonomous Institution)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B. TECH FIRST SERIES EXAMINATION, AUGUST 2026

(S3 ECE A &B) B24EC2T03 NETWORK THEORY

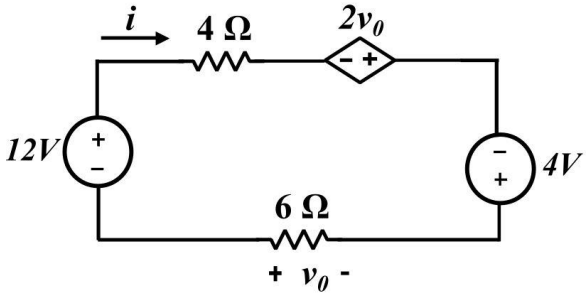
Max. Marks: 40 Duration: 1.5 Hours

PART A

Answer all questions. Each question carries 3 marks.

1. Explain the key differences between independent and dependent sources in circuit theory. (CO1)

2. An electronic control circuit uses a voltage-controlled source to regulate the voltage supplied to a load. As part of the circuit testing process, an engineer must determine the current flowing through the circuit and the voltage across the load resistor. Determine the voltage v_0 and the current i in the circuit shown below. (CO1)



3. What are the limitations of using the Superposition Theorem in circuit analysis? (CO2)

4. A circuit contains only dependent sources and resistors. How is the Thevenin resistance determined in this case? (CO2)

PART B

Answer all questions. Each question carries 14 marks.

5 a. Calculate the mesh currents I_1 and I_2 for the circuit shown below.

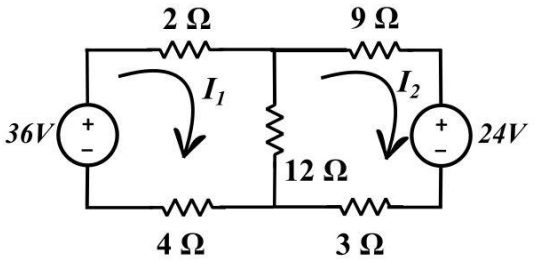
P.T.O.

VISION
Embedding Creativity and fostering quality Education
MISSION
Advance the field of Electronics and Communication by developing and disseminating innovative practices and technologies.

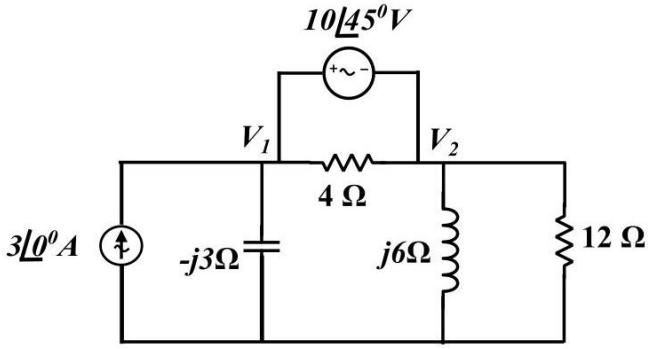
Nurture technically competent professionals in Electronics and Communication Engineering equipped with the skills to address global challenges.

Foster socially responsible technocrats and entrepreneurs who contribute positively to society through their expertise and leadership.

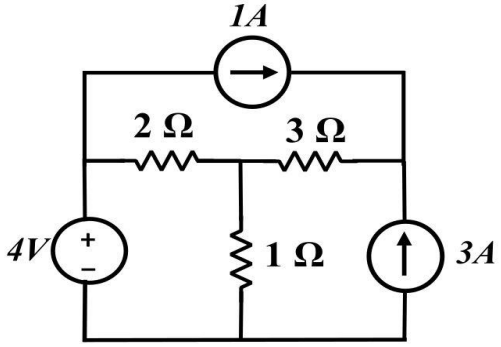
7 marks (CO1)



b. For the circuit shown below determine the voltages at the two nodes voltages V_1 and V_2 . 7 marks (CO1)



6. a. Find the current flowing through the 1Ω resistor using Superposition theorem. 7 marks (CO2)



b. A communication receiver is connected to the output of a signal conditioning circuit represented below. To analyze the effect of connecting different receivers without repeatedly solving the entire circuit, the engineer decides to replace the network with its Thevenin equivalent. Draw the Thevenin's equivalent circuit. 7 marks (CO2)

