



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

Vellore – 632014, Tamil Nadu, India
SCHOOL OF ELECTRICAL ENGINEERING
FALL SEMESTER 2023-2024
CAT-I

SLOT: F2

Programme Name & Branch: B.Tech. in Computer Science and Engineering and Business Systems

Course Code & Course Name: EEE1001 & Basic Electrical and Electronics Engineering

Faculty Name: Dr. Chaman Lal Dewangan **Class Number:** VL2023240107403

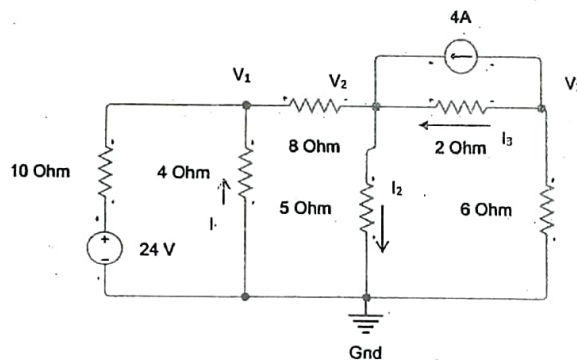
Date of the Examination: 15-Sep-2023, 02:00 PM - 03:30 PM

Duration : 90 minutes

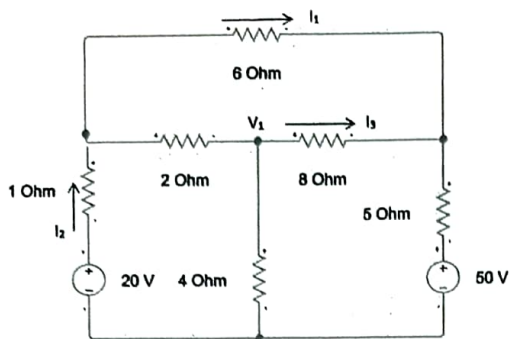
Max. Marks : 50

General instruction(s):

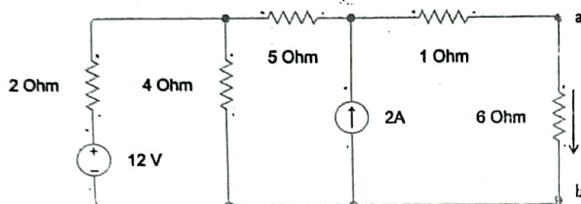
Q. No	Question	Marks
1	In the given circuit below, using node-voltage analysis find V_1 , V_2 , V_3 , I_1 , I_2 , and I_3 .	10 marks



2	In the given circuit below, using mesh-current analysis find V_1 , I_1 , I_2 , and I_3 . Also find power supplied by 50V and 20V voltage sources.	10 marks
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3. Find and draw the Thevenin equivalent network across node a and b. Find the power consumed by 6 Ohm resistance which is across node a and b. In place of this 6 Ohm, what is the value of resistance for which the power received can be maximized.



10 marks

4. A voltage $v(t) = 150 \sin(334t + 10^\circ)$ V, evaluate the frequency, peak voltage, time period, rms value and average value of $v(t)$.

5 marks

5. a) In a series circuit containing a resistance and a capacitor, the current and the voltage are expressed as: $i(t) = 50 \sin\left(320t + \frac{\pi}{3}\right)$, $v(t) = 15 \sin\left(320t + \frac{\pi}{6}\right)$. What is impedance, resistance, capacitance? Draw the current-voltage phasor diagram.

7.5 marks

- b) A voltage $V = 220 + j80$ V, is applied to a series circuit consisting of a resistor = 5 Ohm, an inductor = 2mH and a capacitor = 1mF. The AC power supply frequency is 50 Hz. Find the angle between current and voltage. Find the current magnitude in the circuit. What is the power factor of the circuit. Draw power triangle diagram for the applied voltage and frequency of the circuit.

7.5 marks