

Time: 2 Hr

Maximum Marks: 50

**Instructions to Candidates:**

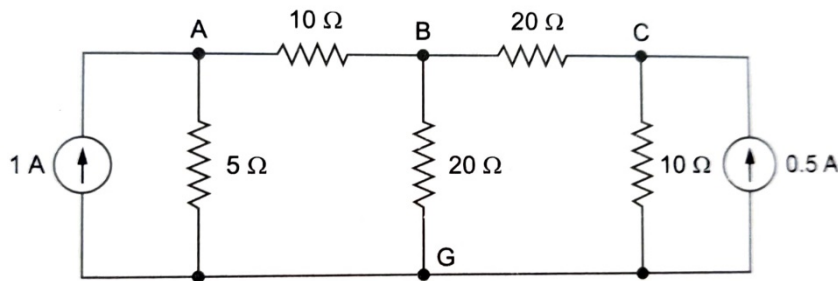
Attempt **any five** questions out of **eight**. (Schematic diagram must be shown wherever necessary). Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

(Descriptive/Analytical/Problem Solving/Design Question)

(5x10=0)

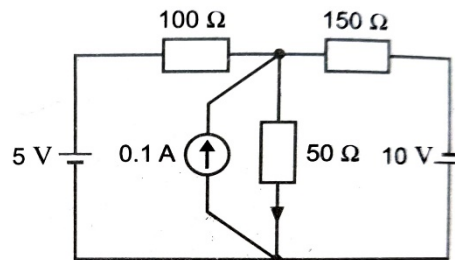
1. Find Current in each branch by using nodal analysis. Also calculate total power loss.

CO1



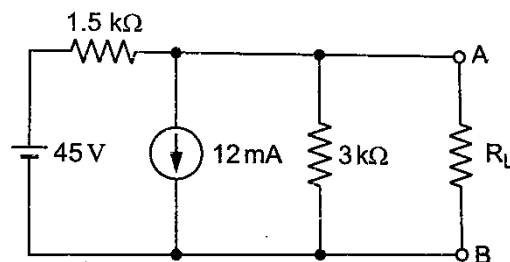
2. State superposition theorem. Apply the same for finding the current in 50Ω resistor with the reference direction shown in the circuit.

CO2



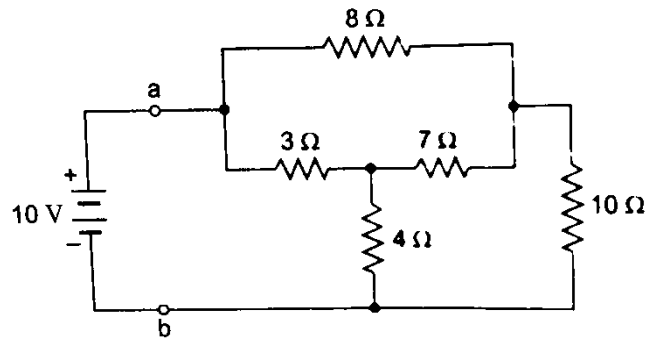
3. How Norton's theorem is equivalent to Thevenin's theorem? Also write the limitation of Thevenin's Theorem and find the voltage across load resistance  $R_L$  using Thevenin's theorem, when load resistance is  $2k\Omega$ .

CO3



4. Express the expression for Star to Delta and Delta to Star transformation. Using delta to star transformation determine the resistance between terminals  $a-b$  and the total power drawn from the supply in the circuit shown in figure.

CO3



5. Define the Average and Effective value of current and voltage. Derive the expression for Average and Effective value of sinusoidal voltage. CO2

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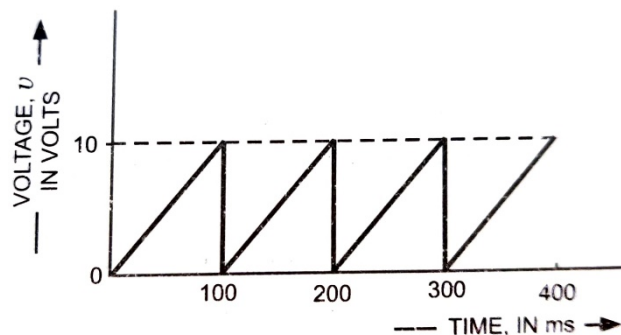
6. An alternating current varying sinusoidally with a frequency of 50 Hz has an rms value of 20A. Write down the equation for the instantaneous value and find this value (a) 0.0025 second after passing through a positive maximum value. At what time, measured from a positive maximum value, will the instantaneous current be 14.14 A? CO1

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7. What do you understand by Form Factor and Peak Factor of waveform? An alternating voltage is  $v=100 \sin(100t)$ . Find: CO1
  - (a) Amplitude
  - (b) Time period and frequency
  - (c) Angular velocity
  - (d) Form factor
  - (e) Peak factor

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8. For the given periodic waveform determine: CO2



- (a) Frequency of the waveform
- (b) Wave equation for  $0 < t < 100$  m second
- (c) RMS value
- (d) Average value
- (e) Form factor