Full Marks: 40   **Time: 2 hours**

Answer All Questions

1. Find the expressions for complete response, natural response, forced response, transient response and steady-state response for a *RL* circuit when a step input is applied to the circuit.

[7]

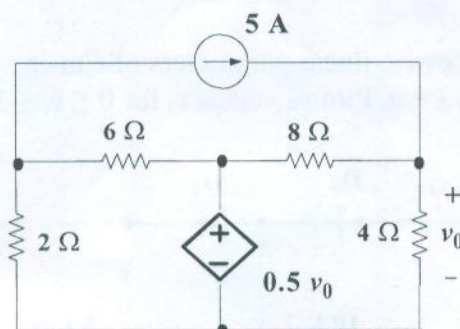2. Calculate the power dissipated in each circuit element in the network of Fig. 1.

Fig. 1   [4]

3. Use the superposition principle to find i_0 and v_0 in the circuit of Fig. 2.

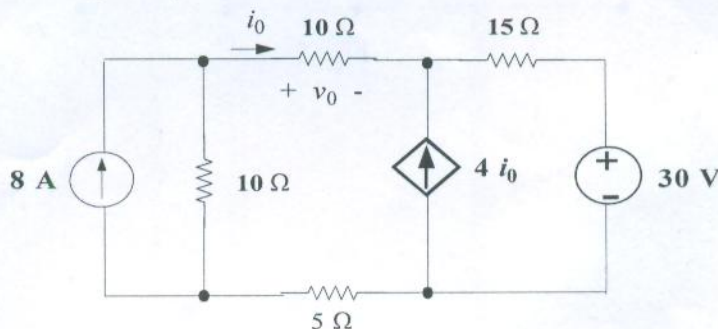Fig. 2   [6]

4. In Fig. 3 the switch has been maintained in open state for a long time and it is closed at $t = 0$. Find $i(t)$ for $t > 0$.
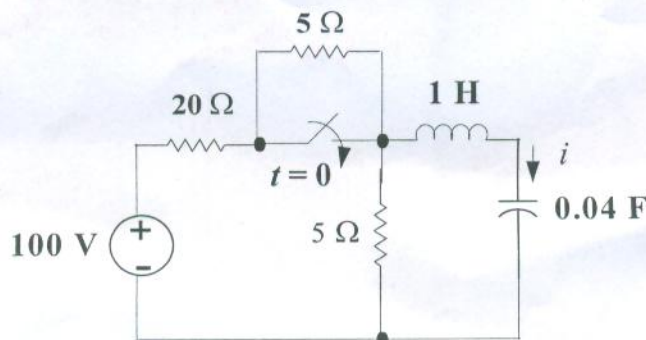

Fig. 3   [7]

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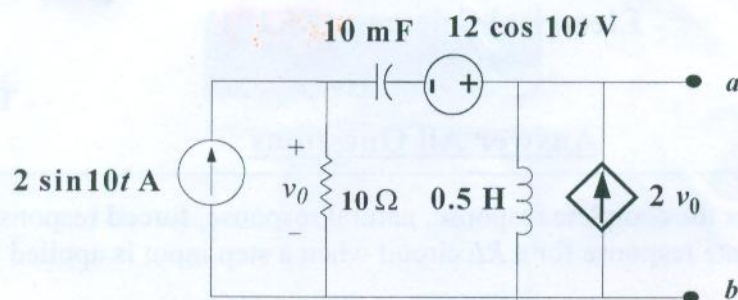5. Obtain Thevenin and Norton equivalent circuits for the network shown in Fig. 4 in reference to terminals *a-b*.

Fig. 4   [8]

6. Each diode in Fig. 5 has piecewise linear parameters of Cut-in voltage (i.e., $V\gamma$) = 0 and Forward diode resistance (i.e., r_f) = 0. Plot v_0 versus v_I for $0 \leq v_I \leq 30$ V.

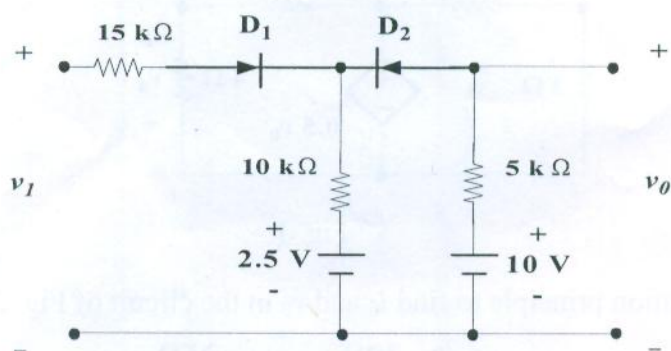Fig. 5   [8]