



1. The bottom node G in the circuit of **Fig. 1** refers to the reference node of zero potential. Find the voltages V_b and V_c . (10%)
2. Find the currents I_a and I_b in the circuit shown in **Fig. 2**. (20%)

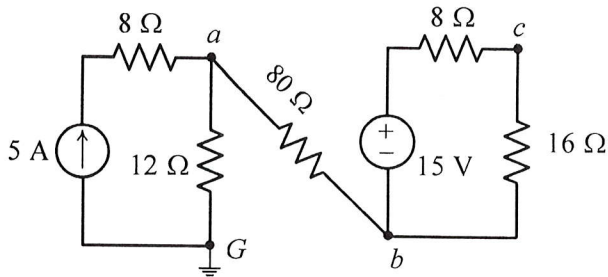


Fig. 1

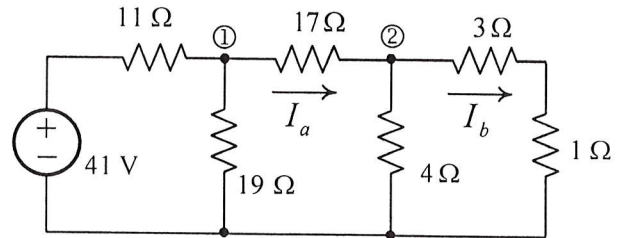


Fig. 2

3. The switch in the circuit of **Fig. 3** has been closed for a long time before opening at $t=0$. Find the current $i(t)$ for $t>0$. (20%)
4. Determine v_o in the circuit in **Fig. 4**. (15%)

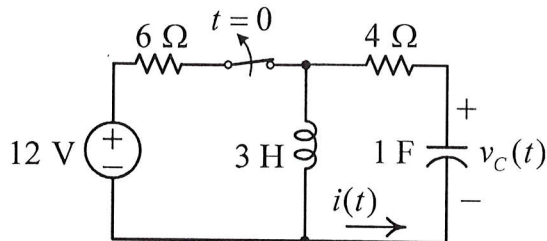


Fig. 3

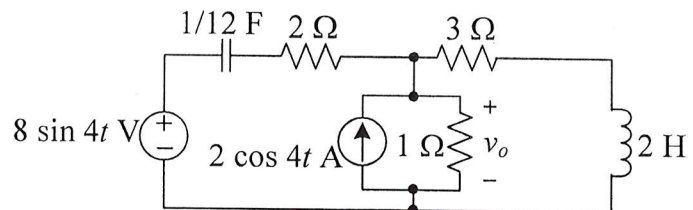


Fig. 4

5. A balanced three-phase source serves three loads, as follows:
 Load 1: 24 kW at 0.6 lagging power factor
 Load 2: 10 kW at unity power factor
 Load 3: 12 kVA at 0.8 leading power factor
 If the line voltage at the loads is 208 V rms at 60 Hz, we wish to determine the line current and the combined power factor of the loads. (15%)
6. The transfer function for a network is

$$\mathbf{H}(s) = \frac{s+10}{s^2+4s+8}$$
 Determine the pole-zero plot of $\mathbf{H}(s)$, the type of damping exhibited by the network, and the unit step response of the network. (20%)