ECE249: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

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1. Find the equivalent resistance across terminal a-b as shown in Fig-1.
2. Obtain the node voltages in the circuit in Fig-2.

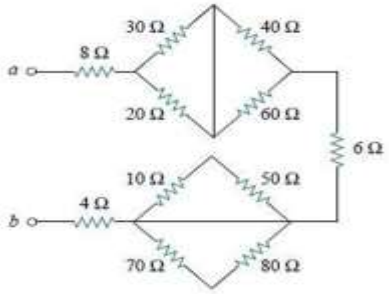

Fig.1

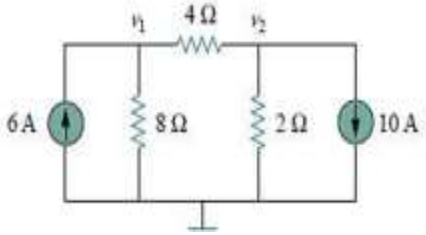

Fig.2

3. Find the branch currents I_1, I_2, and I_3 using mesh analysis in Fig-3.

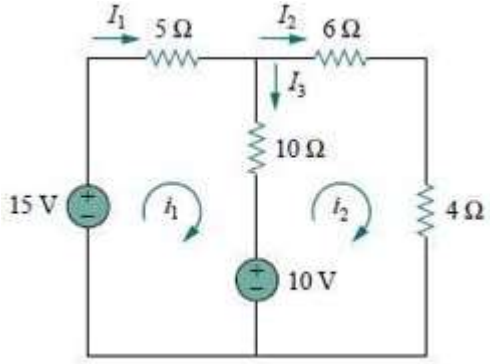

Fig.3

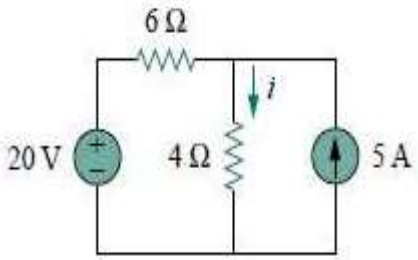

Fig.4

4. Apply superposition theorem to find i in the circuit of Fig-4.

5. The voltage **v = 12 cos (60t + 45°)** is applied to a 0.1 H inductor. Find the steady-state current through the inductor.
6. In a linear circuit, the voltage source is $\mathbf{v_s = 20 \sin (500t + 30^\circ)}$ V.
   (a) What is the angular frequency of the voltage?
   (b) What is the frequency of the source?
   (c) Find the period of the voltage.
   (d) Express vs in cosine form.
   (e) Determine vs at t = 2.5 ms.