

National Institute of Technology Srinagar

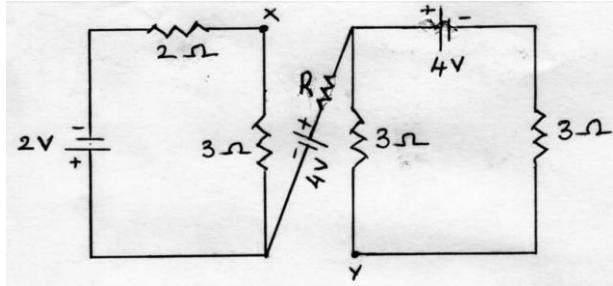
Basic Electrical Engg. | Sem II – CHM

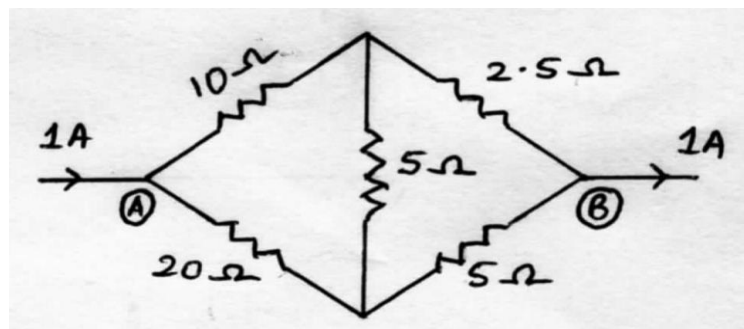
Assignment # 01: DC Circuits

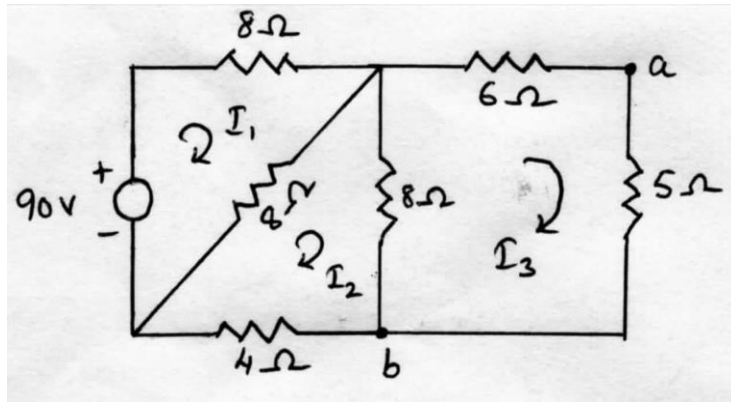
Date of issue: 19 June 2020 | Submission Due: **24 June 2020**

Instructions:

- ANSWER NEATLY AND LEGIBLY in A4 sheets only. •
An incomplete assignment is NOT acceptable for submission.

 <p>The diagram shows two interconnected circuits. The left circuit consists of a 2V DC source in series with a 2Ω resistor, which is in parallel with a 3Ω resistor. The top node of this parallel combination is labeled 'X'. The right circuit consists of a 4V DC source in series with a resistor 'R', which is in parallel with a 3Ω resistor. The bottom node of this parallel combination is labeled 'Y'. The two circuits are connected at their top and bottom nodes.</p>	<p>Q1. Find the potential of X w.r.t. the potential of Y.</p>
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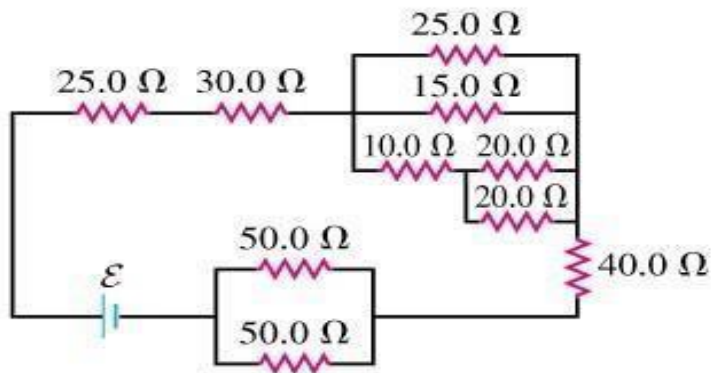
 <p>The diagram shows a bridge-like network of resistors. On the left, a 1A current enters node A. The network consists of a 10Ω resistor in series with a 2.5Ω resistor, a 20Ω resistor in series with a 5Ω resistor, and a central 5Ω resistor. On the right, a 1A current exits node B.</p>	<p>Q2. Find the currents in all the resistors of the network. Also find the potential at A w.r.t. that at B.</p>
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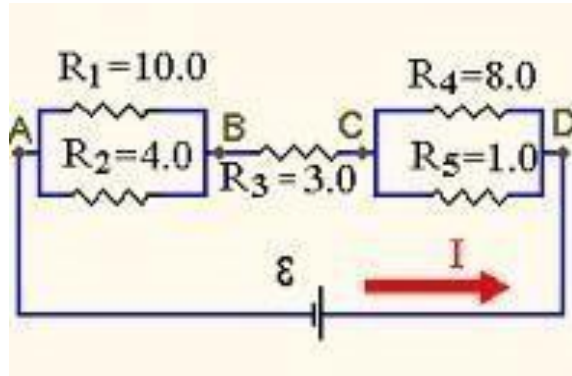
Q3. a) Find the current in the $5\ \Omega$ resistor.

b) Find the potential at b w.r.t. that at a if the $5\ \Omega$ resistor is removed and the terminals $a-b$ are open circuited.

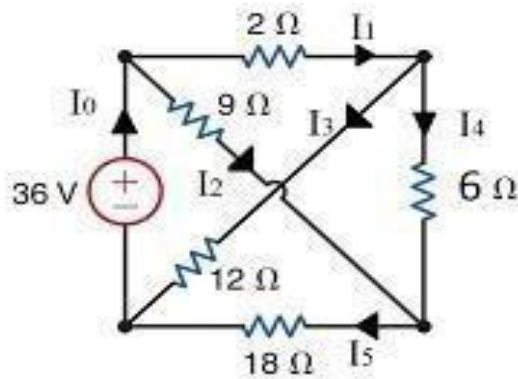
c) The $5\ \Omega$ resistor removed from the circuit and the $90\ \text{V}$ source is replaced by a $10\ \Omega$ resistor. Determine the resistance that will be measured across $a-b$.



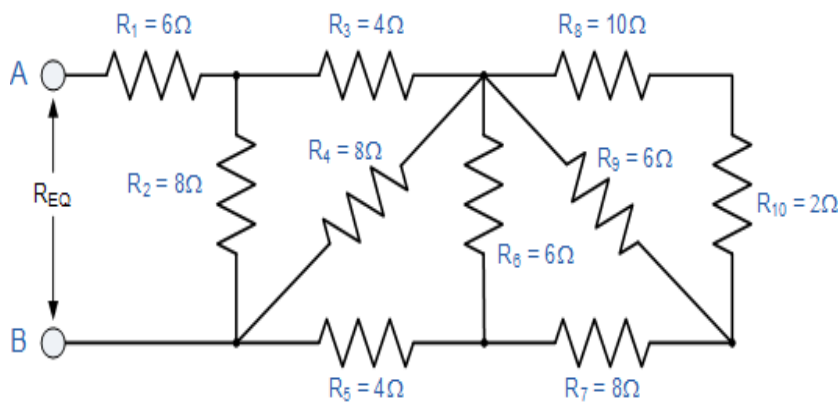
Q4. If the drop across the $10\ \Omega$ resistor is $20\ \text{V}$, find the current through the $15\ \Omega$ resistor and the power supplied by the battery.



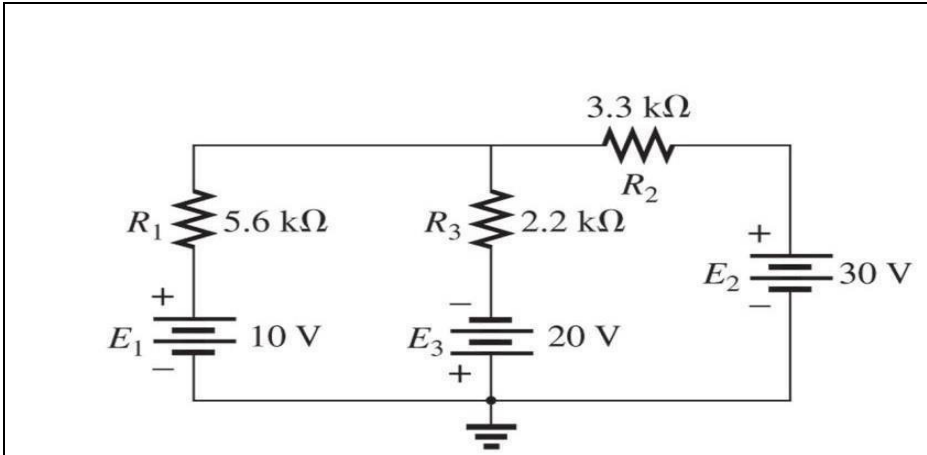
Q5. If $I = 5 \text{ A}$, find E , the potential at D w.r.t. the potential at B and the potential at A w.r.t. the potential at C .



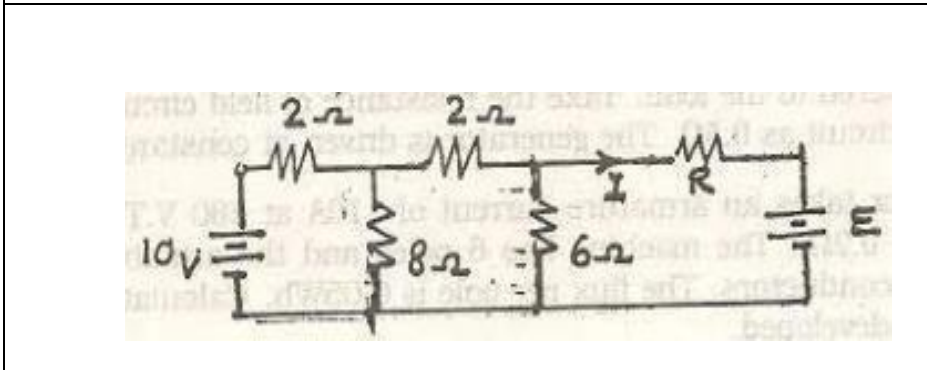
Q6. Find all the branch currents.



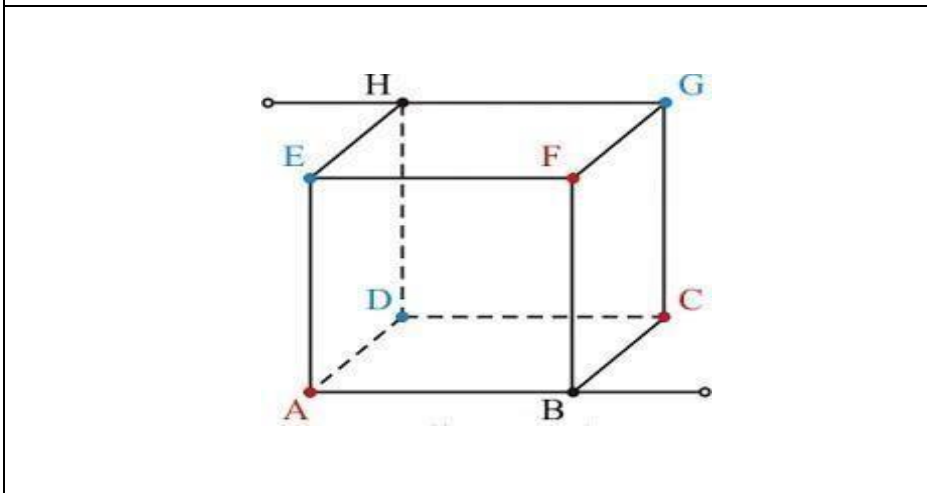
Q7. Find the equivalent resistance across A & B .



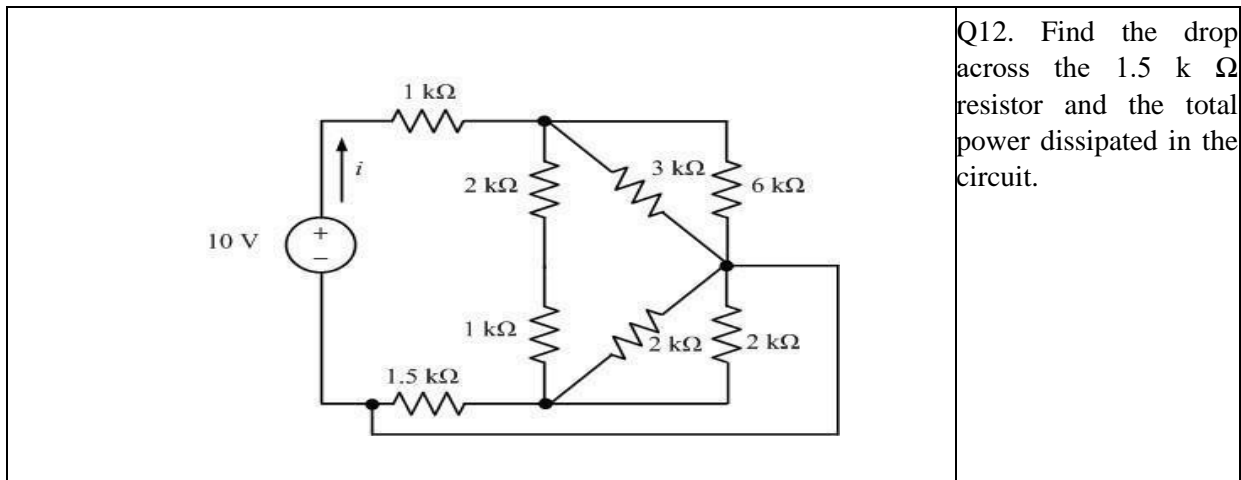
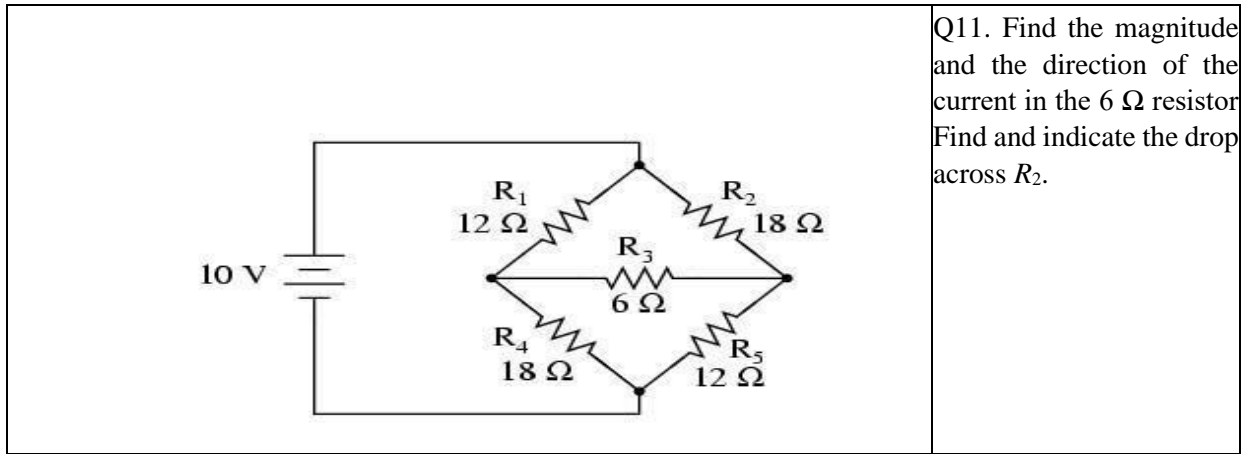
Q8. Find all the branch currents and indicate them in the circuit diagram.



Q9. Determine the value of E so that the current I is 0 A.



Q10. Find the equivalent resistance across H & B if the resistance of each branch is R.



You are strongly advised to take the assignments very seriously.

Submission Due: **24 June 2020**

Good luck!