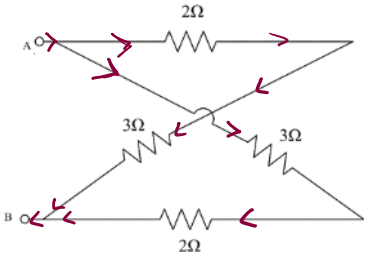
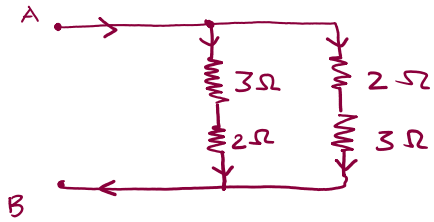
L2-BET-23Oct2021-Teams6-7

22 October 2021 12:19

Illustration 1: Find the equivalent resistance of the networks given below.

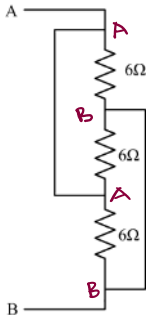


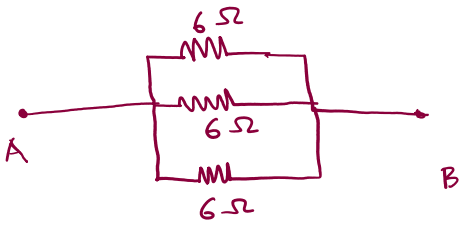


$(3+2) \,||\, (2+3)$

$R_{eq} = 2.5\,\Omega$

$(R||R,\ R_{eq} = \frac{R}{2})$

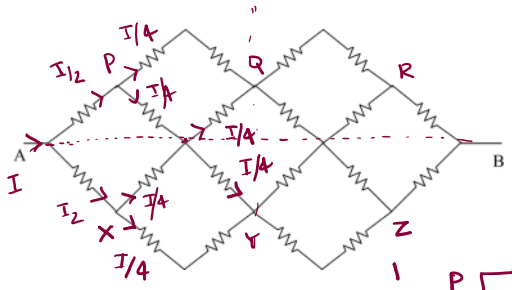




$R_{AB} = (6||6||6)$

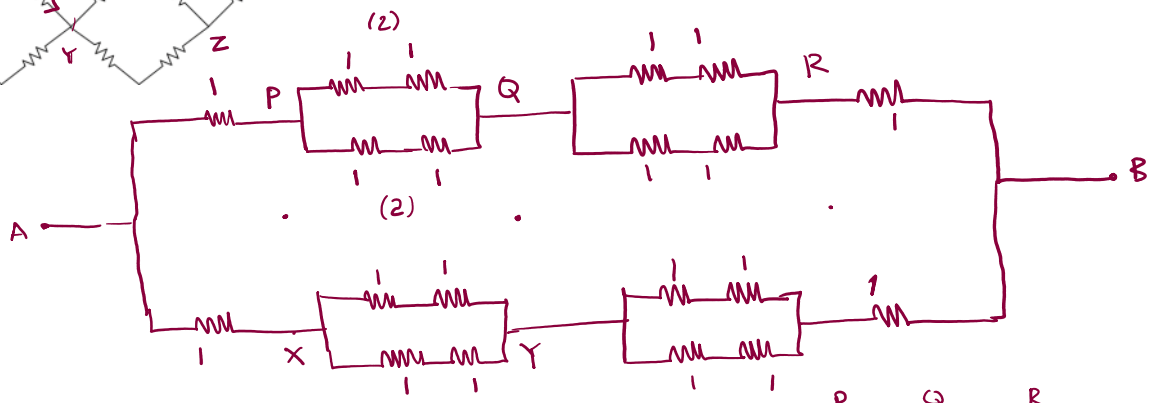
$= 2\,\Omega \quad (R||R/n,\ R_{eq} = \frac{R}{n+1})$

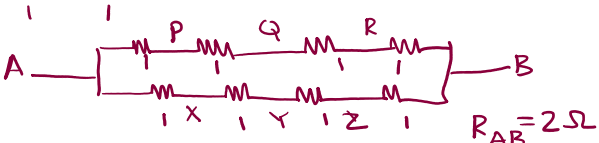
Illustration 2: Determine the equivalent resistance between the points A and B for the given resistive network with 1 Ω resistors



Horizontal Plane of Symmetry (HPS) or Horizontal Folding

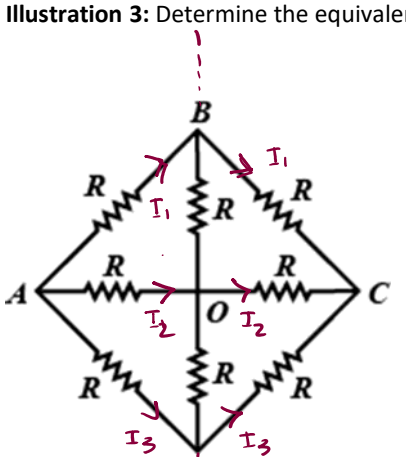
- Points which are mirror image about the HPS have the same potential

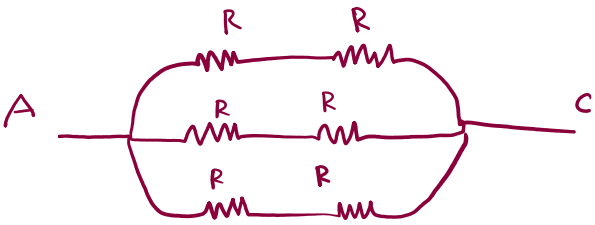




$R_{AB} = 2\,\Omega$

Illustration 3: Determine the equivalent resistance between the points **A** and **C** for the given resistive network.

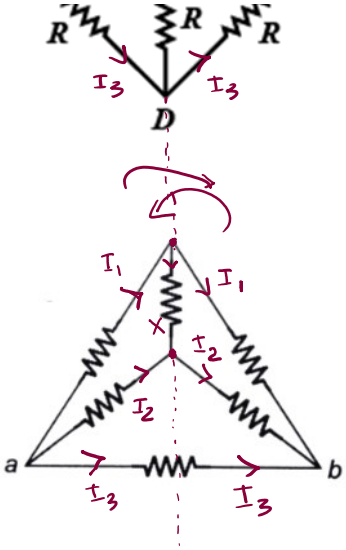




$R_{AC} = \frac{2R}{3}\ \Omega$

Vertical Plane of Symmetry (VPS) or Left-Right Symmetry/Folding

- Points on VPS have the same potential
- Branches which are mirror image about the VPS have the same current



Vertical Plane of Symmetry (VPS) or Left-Right Symmetry/Folding
- Points on VPS have the same potential
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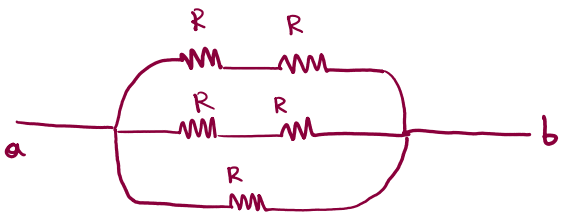


$R_{ab} = \frac{R}{2}\ \Omega$

Q1 of Quiz

An inductor and a resistor opposes _____ & _____ respectively

a) flow of current, rate of change of current
b) rate of change of current, flow of current ✓
c) rate of change of current, rate of change of current
d) flow of current, flow of current

Q2 of Quiz

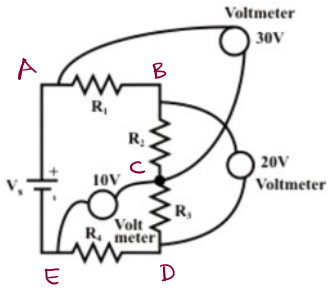
The source voltage is ___

a) 10 V
b) 20 V
c) 30 V
d) 40 V ✓

$V_s = (V_{AB} + V_{BC}) + (V_{CD} + V_{DE})$

$= 30 + 10$

$= 40V$



Q3 of Quiz

Two incandescent bulbs of 40 W and 60 W ratings are connected in series across the mains. Assuming the voltage rating of both the bulbs to be same, which of the following statement(s) is (are) correct?

a) The bulbs together will consume 100 W
b) The bulbs together will consume 50 W
c) The 60 W bulb glows brighter
d) The 40 W bulb glows brighter ✓

$R_{40W} = \frac{x^2}{40} > R_{60W} = \frac{x^2}{60}$ as $\text{Power} = \frac{\text{Voltage}^2}{\text{Resistance}}$

When connected in series current flowing through each element is same.

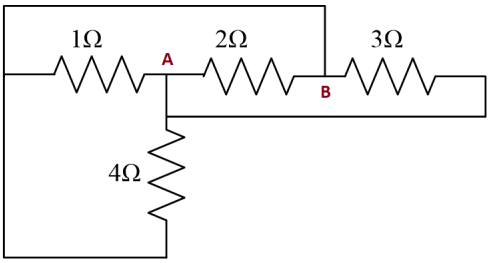
then, $P_{40W} = I^2 R_{40W} > P_{60W} = I^2 R_{60W}$

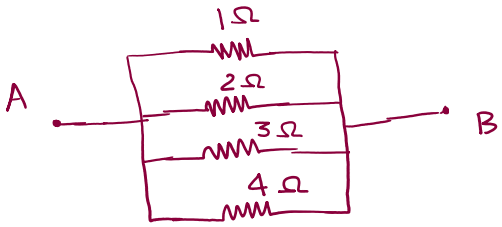
So, 40W bulb will glow brighter.

Q4 of Quiz

Resistors in the following circuit are connected in

a) Series
b) Parallel ✓
c) Combination of series and parallel
d) None of the above





$$R_{AB} = \frac{1}{\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}}$$

$$R_{AB} = \frac{12}{25} = 0.48\ \Omega$$

(Total resistance is less than the least one)