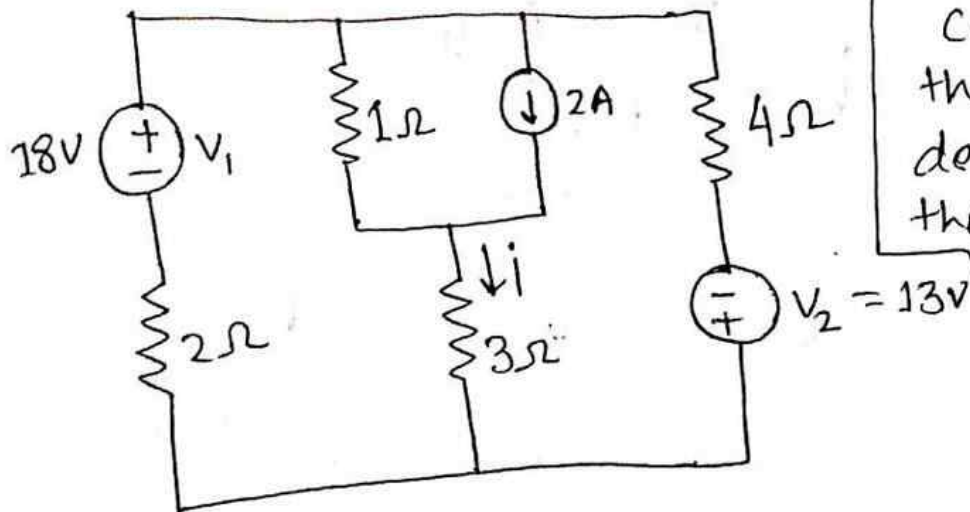


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Answer

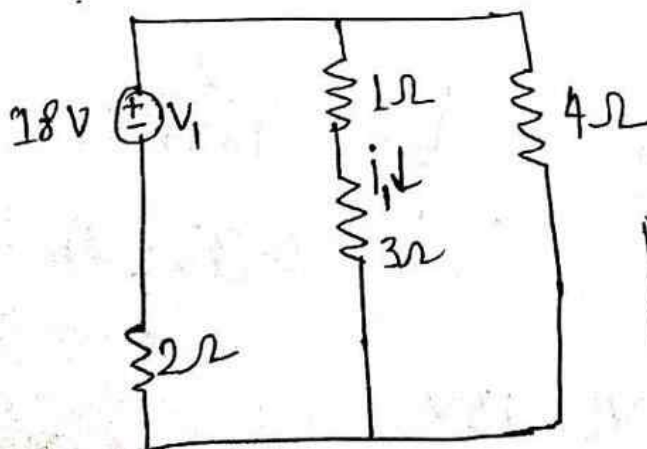
given



calculate
the power
delivered to
the 3Ω &
resistor

Solution

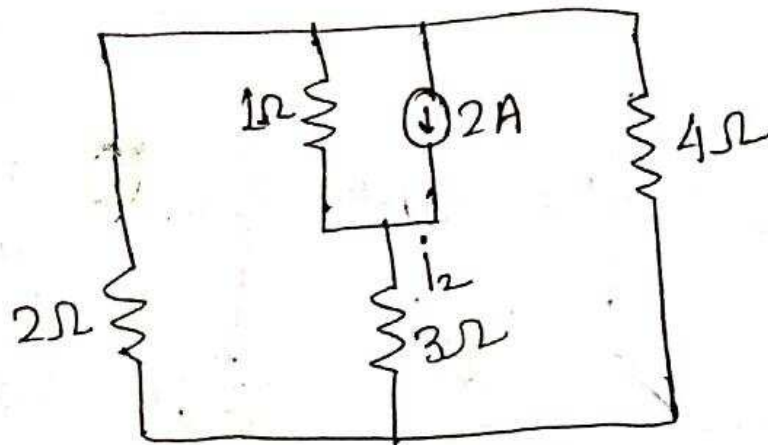
Case-1: Consider $V_1 = 18V$ is activated
other are deactivated means
current source is open circuit
and voltage source is short-circuit



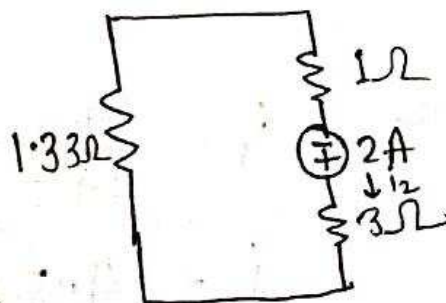
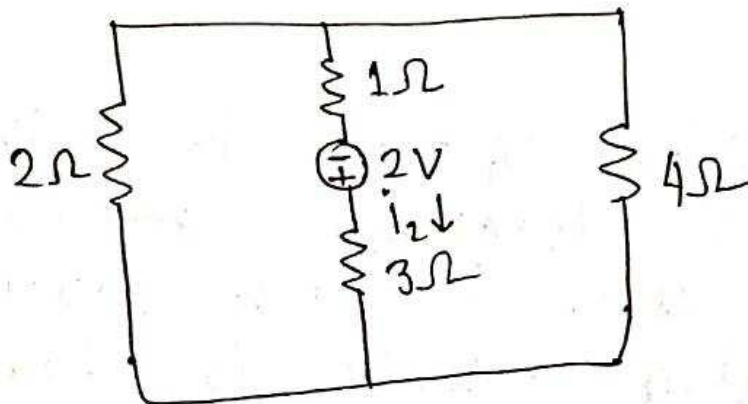
$$i_1 = \frac{18}{1+3} = \frac{18}{4}$$

$$\therefore i_1 = 4.5 A$$

Case-2; consider 2A source is activated other are deactivated



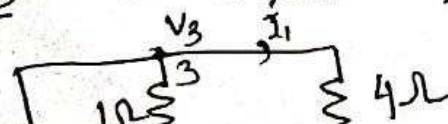
use source transformation



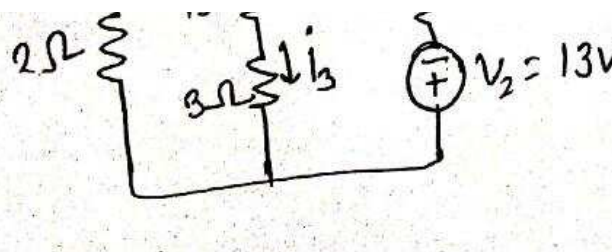
$$i_2 = \frac{2}{1+3+1.33}$$

$$\therefore i_2 = 0.375 \text{ A}$$

Case-3 consider $V_2 = 13\text{V}$



KCL at node 1/3,
 $V_2 + 13 = V_1 = V_3$



$$\frac{0}{4} + \frac{3}{4} + \frac{3}{2} = 0$$

$$\Rightarrow V_3 \left(\frac{1}{4} + \frac{1}{4} + \frac{1}{2} \right) = -\frac{13}{4}$$

$$\therefore V_3 = -\frac{13}{4} \text{ volt}$$

$$\therefore i_3 = \frac{V_3}{4} = \frac{-\frac{13}{4}}{4} = -0.81 \text{ A}$$

hence $i = i_1 + i_2 + i_3$

$$= 4.5 + 0.375 - 0.81$$

$$\therefore i = 4.065 \text{ A}$$

• power delivered by 3Ω resistor

$$P = i^2 \times 3 = (4.065)^2 \times 3 = 49.57 \text{ W}$$

Likes: 0

Dislikes: 0