LOKENATH
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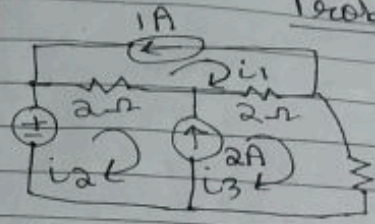
Date

Problems on Module 1

Q)



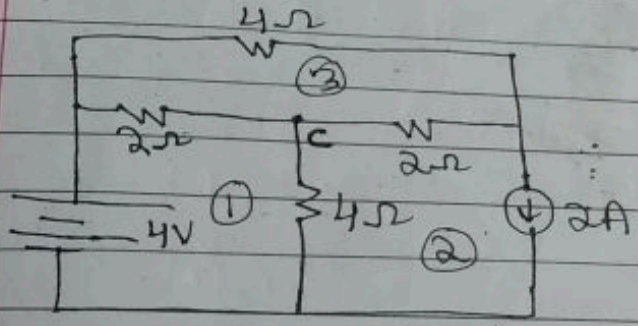
In this $i_1 = -1A$
and $i_3 - i_2 = 2$

for 3rd eqn → supermesh
we remove current source and use KVL

$2(i_2 - i_1) + 2(i_3 - i_1) + 6i_3 - 10 = 0$

$i_3 = 1A$, $i_2 = -1A$

Q)



KVL in (1) →

→ $4 - 2i_1 - 2i_3 - 4i_1 - 4i_2 = 0$

→ $-2i_3 - 6i_1 = 4$ → (1)

KVL in (2) →

$-V_c = -4i_1 + 6i_2 - 2i_3 = 0$ → (2)

$\{-V_c - 4(i_2 - i_1) - 2(i_2 - i_3)\} = 0$

how $i_2 = -2A$

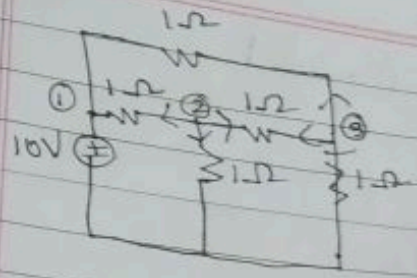
$-V_c = -4i_1 - 12 - 2i_3 = 0$ → (3)

KVL in (3) → and $i_2 = -2$

→ $2i_1 - 3i_3 = 0$

solving we get $i_1 = 4.46$, $i_3 = -0.615$, $V_c = 28.61V$

Q)



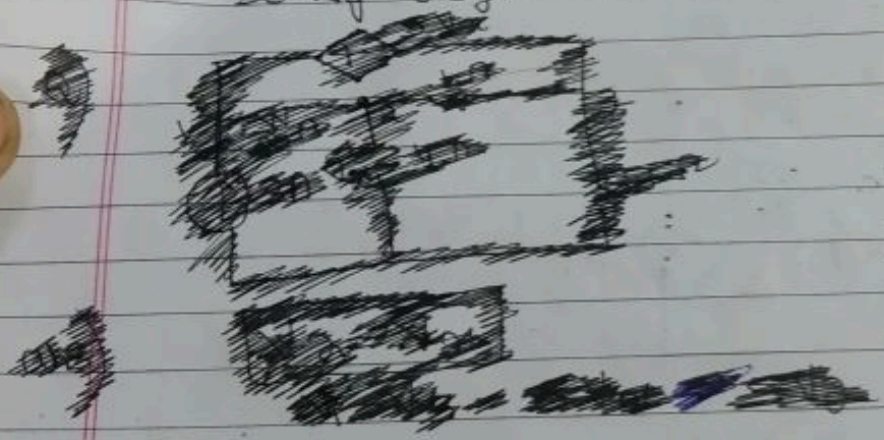
ans) $V_1 - 0 = 10V$

$V_1 = 10V \rightarrow ①$

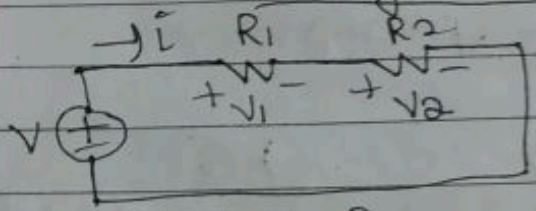
$$\rightarrow \frac{V_2 - V_1}{1} + \frac{V_2 - 0}{1} + \frac{V_2 - V_3}{1} = 0$$

$$\rightarrow \frac{V_3 - V_1}{1} + \frac{V_3 - V_2}{1} + \frac{V_3}{1} = 0$$

solving we get $V_3 = 5V$



Voltage divider Rule



$$V_1 = \frac{R_1}{R_2 + R_1} \times V$$

$$V_2 = \frac{R_2}{R_2 + R_1} \times V$$

Current divider rule

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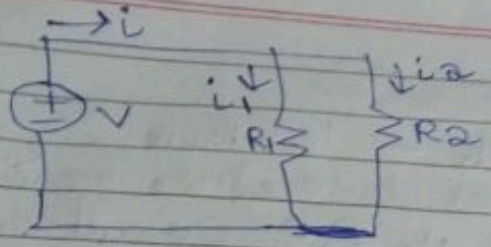
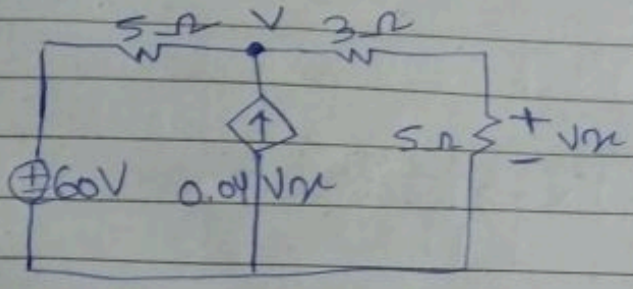


$$i_1 = \frac{R_2}{R_1+R_2} \times i$$

$$i_2 = \frac{R_1}{R_1+R_2} \times i$$

Q)



and $\frac{V-60}{5} + \frac{V-0}{8} = 0.04V_x \rightarrow (1)$

current through $5\Omega \rightarrow \frac{V_x}{5} = 0.2V_x$

hence current through $3 \rightarrow 0.2V_x$

so V through $3\Omega \rightarrow 0.6V_x$

so $V - 0.6V_x - V_x = 0$

$$\boxed{V = 1.6V_x}$$

and solve $\rightarrow V_x = 25V$

End of practice