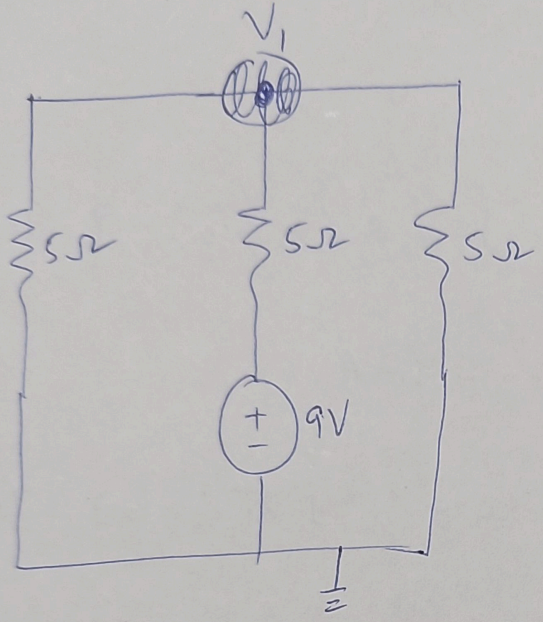
CSET102

Quiz-2 Solutions

(1)



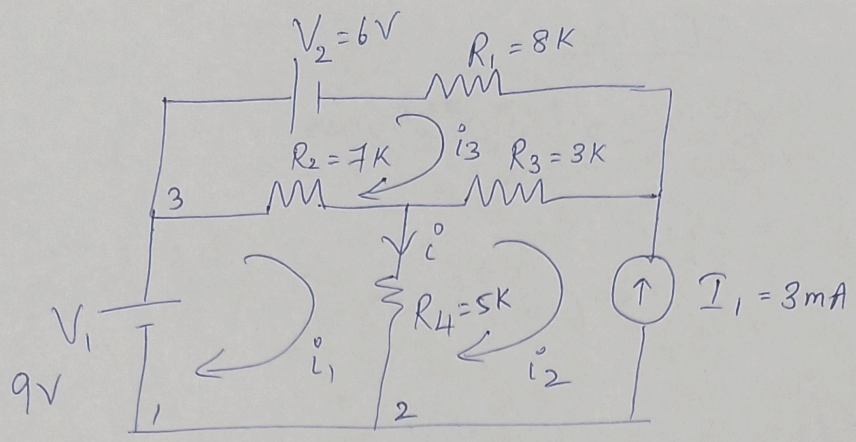
$$\frac{V_1 - 0}{5} + \frac{V_1 - 9}{5} + \frac{V_1 - 0}{5} = 0$$

$$3V_1 - 9 = 0$$

$$3V_1 = 9$$

$$V_1 = 3V.$$

(2)



Mesh 1 $\rightarrow$ $7(i_1 - i_3) + 5(i_1 - i_2) - 9 = 0$ — (1)

Mesh 2 $\rightarrow$ $I_2 = -3mA$ (2)

Mesh 3 $\rightarrow$ $6 + 8i_3 + 3(i_3 - i_2) + 7(i_3 - i_1) = 0$ (3)

Put (2) in (1)

$12i_1 - 7i_3 + 15 - 9 = 0$

$12i_1 - 7i_3 = -6$

Put (2) in (3)

$-7i_1 + 18i_3 = -15$

$i_1 = -1.275mA$ $\quad$ $i_3 = -1.329\ mA$

Current through $R_4 = i = i_1 - i_2$

$= -1.275 - (-3)$

$i = 1.725\ mA$