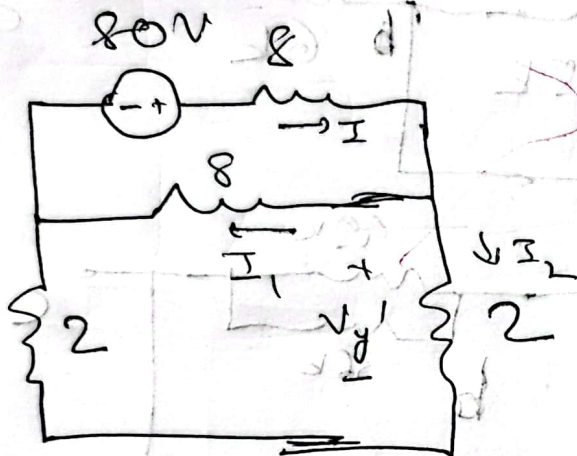
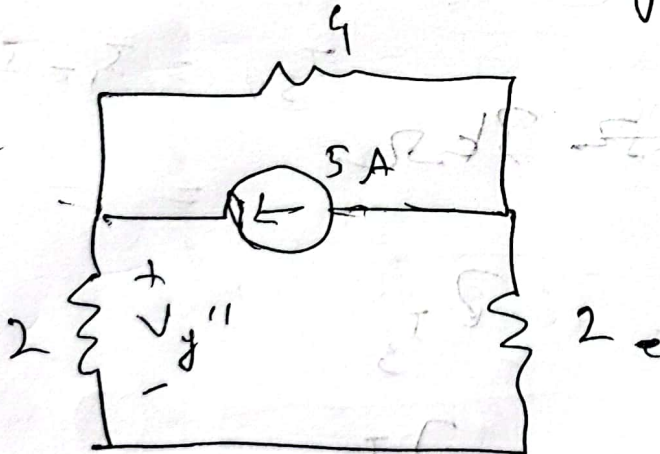


Set - B

1)

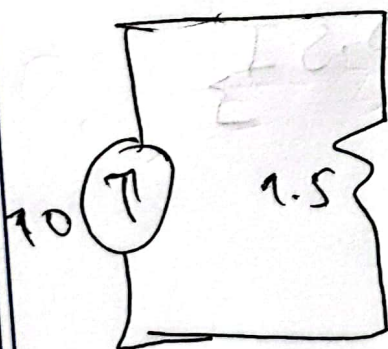
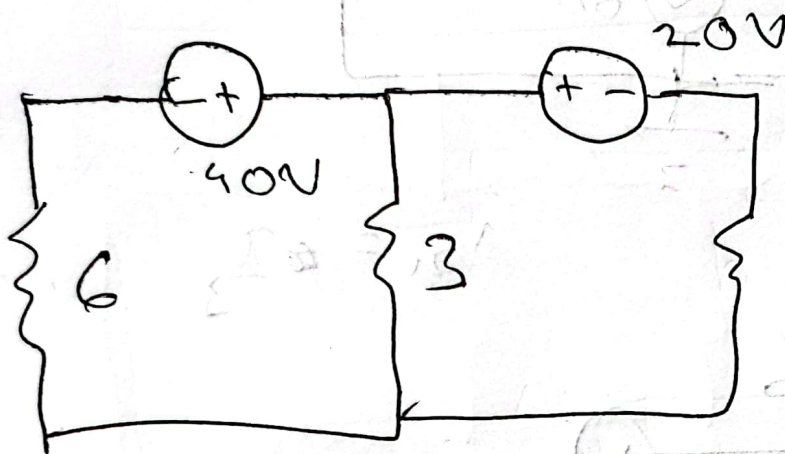
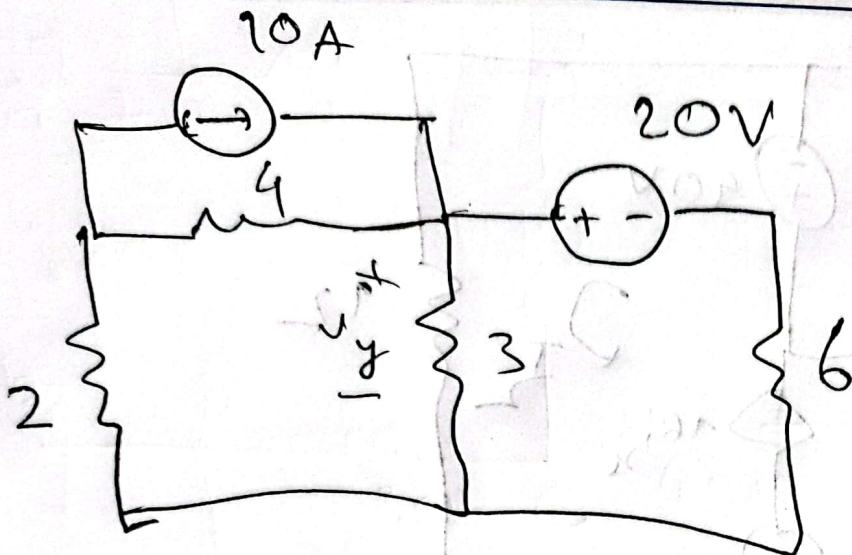


$$I = 7.5A, I_2 = 5A, V_{y'} = 10V$$



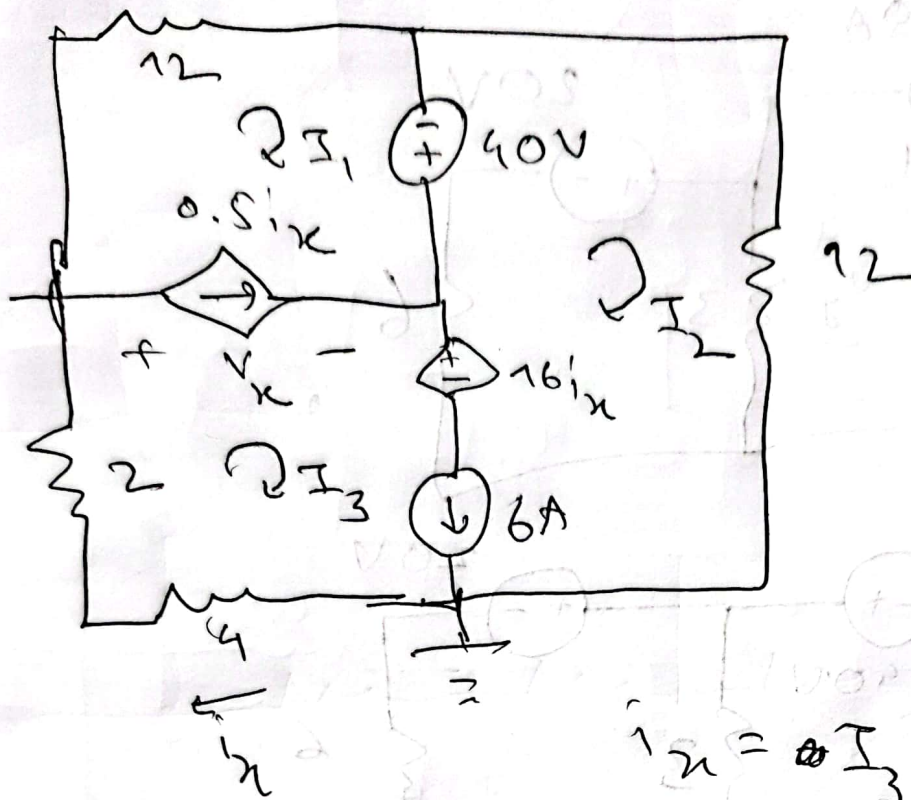
$$V_{y''} = 5V$$

$$V_y = 15V$$



$$V_y = 15\text{V}$$

2)



$$-I_2 + I_3 = 6 \quad \text{--- (I)}$$

$$-I_1 + I_3 = 0.5i_x = 0.5I_3$$

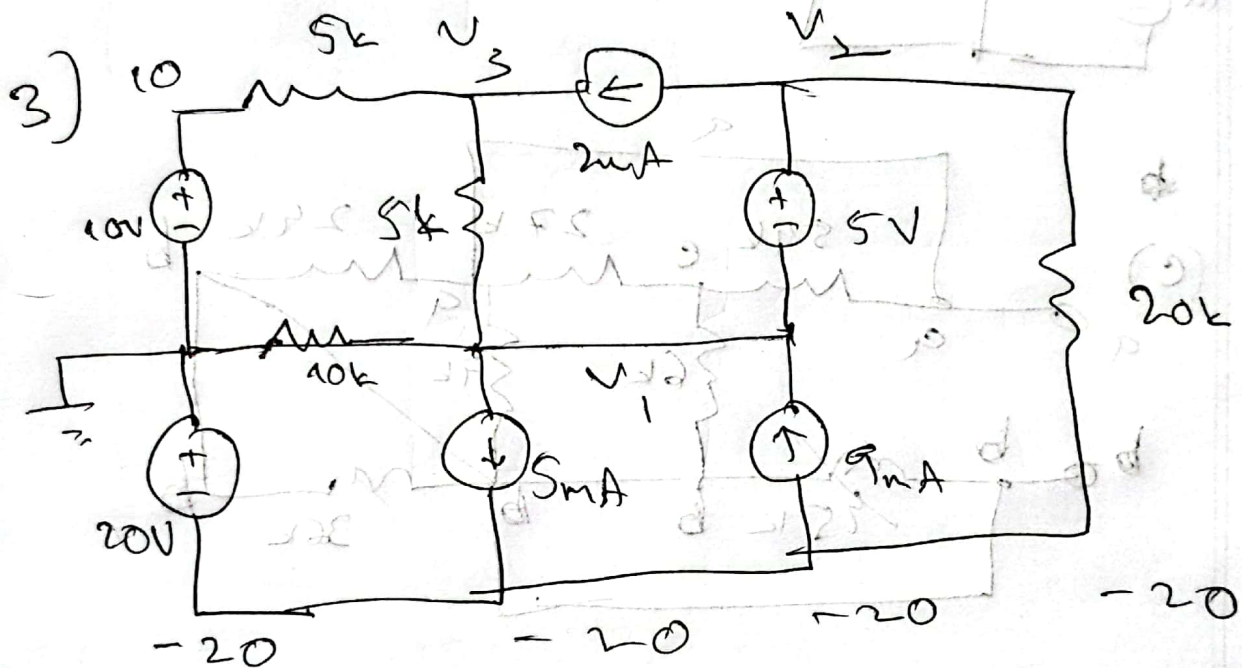
$$\text{or, } -I_1 + 0.5I_3 = 0 \quad \text{--- (II)}$$

$$12I_1 + 12I_2 + 6I_3 = 0 \quad \text{--- (III)}$$

$$I_1 = 1.5A, I_2 = -3A, I_3 = 3A$$

$$42.5 - 40 - V_x = 0$$

$$\text{or, } V_x = \cancel{-42.5} - 22V$$



$$-V_1 + V_2 = 5 \quad \text{--- (i)}$$

$$-2 + \frac{V_3 - V_1}{5} + \frac{V_3 - 10}{5} = 0$$

$$\text{or, } -0.2V_1 + 0.4V_3 = 4 \quad \text{--- (ii)}$$

$$2 + \frac{V_2 + 20}{20} = -9 + 5 + \frac{V_1}{10} + \frac{V_1 - V_3}{5}$$

$$0.3V_1 + 0.05V_2 - 0.2V_3 = 9 \quad \text{--- (iii)}$$

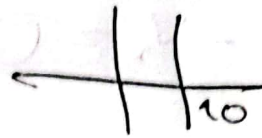
$$V_1 = 11V, V_2 = 16V,$$

$$V_3 = 15.5V$$

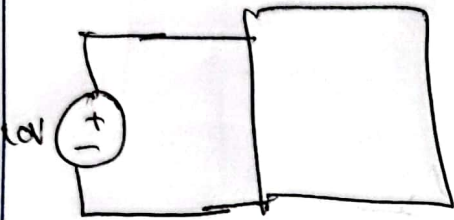
$$I_{5V} = 2 + \frac{15.5 + 20}{20} = 3.8mA$$

$$P_{5V} = -18.195mW = -19mW$$

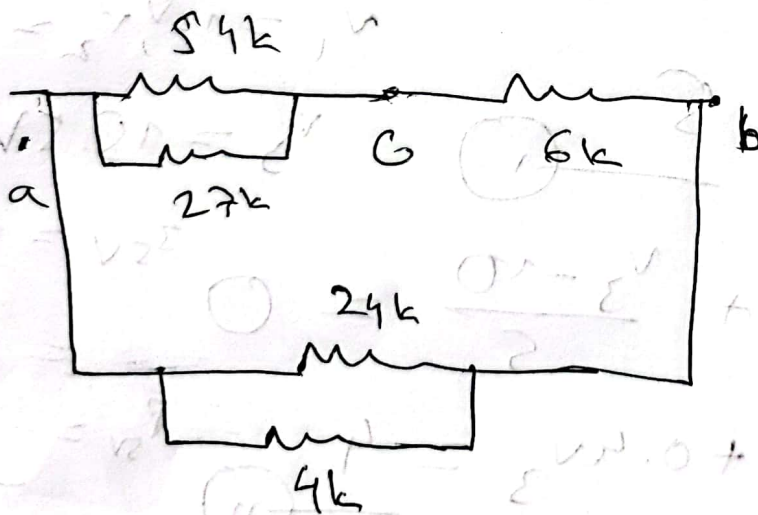
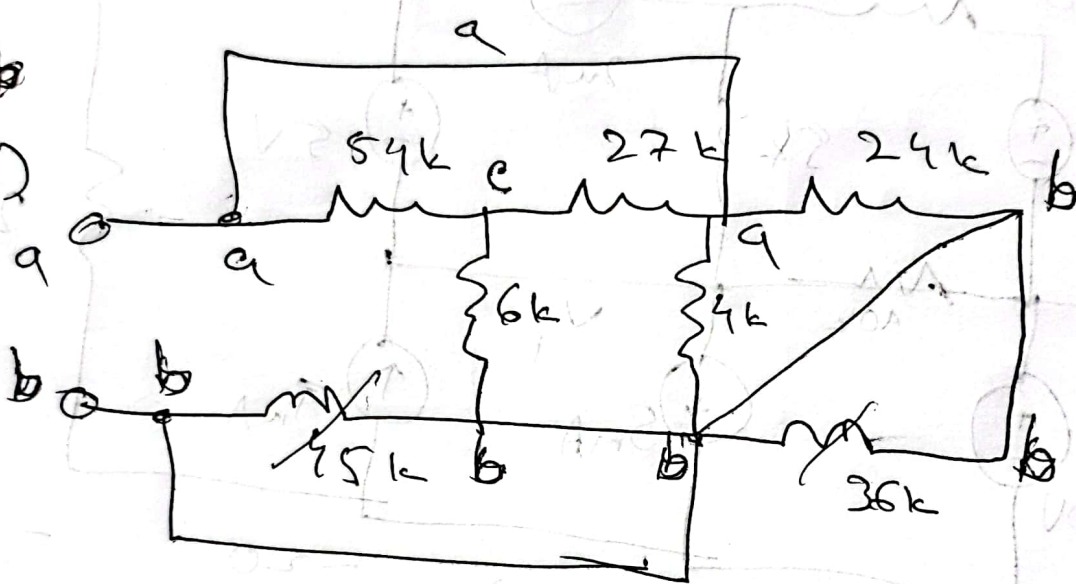
4) (a) $V = 10V$



(b)



(c)



$$R_{eq} = 36\Omega$$