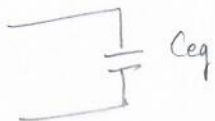
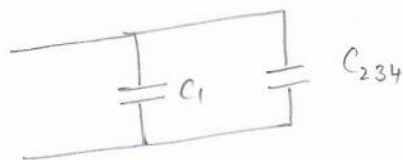
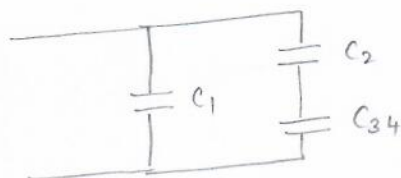


Problem 1

$$C_{34} = C_3 + C_4 \\ = 7.0 \mu\text{F}$$

$$\frac{1}{C_{234}} = \frac{1}{C_2} + \frac{1}{C_{34}} \\ = \frac{1}{2.0} + \frac{1}{7.0} = \frac{9.0}{14.0}$$

$$C_{234} = \frac{14}{9.0} \mu\text{F}$$

$$C_{eq} = C_1 + C_{234} \\ = 1.0 + \frac{14}{9.0} = \frac{23}{9.0} = 2.6 \mu\text{F}$$

Problem 2

$$V_a - V_b = IR$$

$$I = \frac{V_a - V_b}{R} = \frac{6.0 - 1.5}{1.5 \text{ k}} = 3.0 \text{ mA}$$

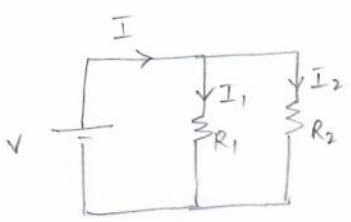
Problem 3

$$[RC] = T$$

Problem 4

Zero.

Problem 5



$$V = V_1 = V_2$$

$$I = I_1 + I_2$$

$$I_1 = \frac{V_1}{R_1} = \frac{10.0}{10.0} = 1.00 \text{ A}$$

$$I_2 = \frac{V_2}{R_2} = \frac{10.0}{20.0} = 0.500 \text{ A}$$

Problem 6

$$I_2 + I_3 = I_1$$

segment cda:

$$V_c - I_3 R_3 - I_1 R_1 = V_a$$

$$30.0 - I_3 30.0 - (I_2 + I_3) 10.0 = 10.0$$

$$1.00 I_2 - 4.00 I_3 = 2.00$$

segment bda:

$$V_b - I_2 R_2 - I_1 R_1 = V_a$$

$$20.0 - I_2 20.0 - (I_2 + I_3) 10.0 = 10.0$$

$$3.00 I_2 - 1.00 I_3 = 1.00$$

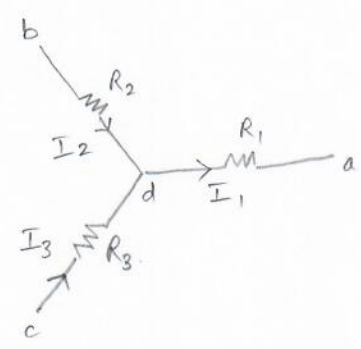
$$1.00 I_2 - 4.00 I_3 = 2.00$$

$$3.00 I_2 - 1.00 I_3 = 1.00$$

$$I_2 = \frac{2.00}{11.0} = 0.182 \text{ A}$$

$$I_3 = \frac{5.00}{11.0} = 0.455 \text{ A}$$

$$I_1 = \frac{7.00}{11.0} = 0.636 \text{ A}$$



Problem 7

We know $\vec{F}_1 + \vec{F}_2 = 0$

$$\begin{aligned} \vec{F}_2 &= -\vec{F}_1 \\ &= -\left[+\hat{y} I L B \sin 90 \right] \\ &= -\hat{y} I L B \end{aligned}$$

