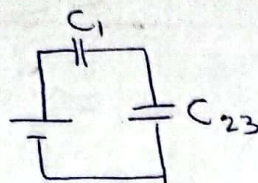


$$\left\{ \begin{array}{l} C_1 = 4 \mu F \\ C_2 = 6 \mu F \\ C_3 = 8 \mu F \\ \Delta V = 12 V \end{array} \right.$$

20) Calcular  $C_{eq}$

•  $C_2$  y  $C_3$  están en paralelo

$$C_{23} = C_2 + C_3 = 8 \mu F + 6 \mu F = 14 \mu F$$



•  $C_1$  y  $C_{23}$  están en serie



$$\frac{1}{C_{eq}} = \frac{1}{C_1} + \frac{1}{C_{23}} \rightarrow C_{eq} = \frac{C_1 \cdot C_{23}}{C_{23} + C_1}$$

$$C_{eq} = \frac{4 \cdot 14}{14 + 4} = \frac{56}{18} \mu F = \frac{28}{9} \mu F \approx 3,11 \mu F$$

b) Carga total  $Q_T$

20

$$Q_T = \Delta V \cdot C_{eq} = 12 V \cdot \frac{28}{9} \mu F = \frac{336}{9} \mu C = \frac{112}{3} \mu C \approx 37,33 \mu C$$

c)  $Q$  y  $\Delta V$  en cada capacitor

30

$$C_1 \text{ y } C_{23} \text{ están en serie} \rightarrow Q = Q_T \quad Q_1 = \frac{112}{3} \mu C = Q_{23} \approx 37,33 \mu C$$

$$\Delta V_1 = \frac{Q_1}{C_1} \Rightarrow \Delta V_1 = \left( \frac{112}{3} \right) : 4 \Rightarrow \Delta V_1 = \frac{112}{12} V = \frac{28}{3} V \approx 9,33 V$$

$$\Delta V_{23} = \frac{Q_{23}}{C_{23}} \Rightarrow \Delta V_{23} = \left( \frac{112}{3} \right) : 14 \Rightarrow \Delta V_{23} = \frac{56}{21} V = \frac{8}{3} V \approx 2,66 V$$

$$C_2 \text{ y } C_3 \text{ están en paralelo} \rightarrow \Delta V = \Delta V_{23} \quad \Delta V_2 = \frac{56}{21} V \cdot \frac{8}{3} = \frac{56}{21} V = \frac{8}{3} V \approx 2,66 V$$

$$Q_2 = \Delta V_2 \cdot C_2 \Rightarrow Q_2 = \frac{56}{21} \cdot 6 \mu C \Rightarrow Q_2 = 16 \mu C$$

$$Q_3 = \Delta V_3 \cdot C_3 \Rightarrow Q_3 = \frac{56}{21} \cdot 8 \mu C \Rightarrow Q_3 = \frac{448}{21} \mu C = \frac{64}{3} \mu C \approx 21,33 \mu C$$

d) Energía total  $U$

40

$$U = \frac{1}{2} Q \cdot \Delta V = \frac{1}{2} C \cdot (\Delta V)^2 = \frac{1}{2} \frac{Q^2}{C}$$

$$U = \frac{1}{2} \cdot \left( \frac{112}{3} \right) \cdot 12 \Rightarrow U = 224 \mu J$$

e)  $C_1$  conductiva. Ahora  $C_1 = 4 \cdot 2 \mu F = 8 \mu F$

$C_{23} = 14 \mu F$  (quedo igual)

$$C_{eq} = \frac{C_1 \cdot C_{23}}{C_{23} + C_1} \Rightarrow C_{eq} = \frac{8 \cdot 14}{14 + 8} \Rightarrow C_{eq} = \frac{56}{11} \mu F \approx 5,09 \mu F$$

$$U = \frac{1}{2} C_{eq} (\Delta V)^2 \Rightarrow U = \frac{1}{2} \cdot \frac{56}{11} (12)^2 \Rightarrow U = \frac{4032}{11} \mu J \approx 366,54 \mu J$$