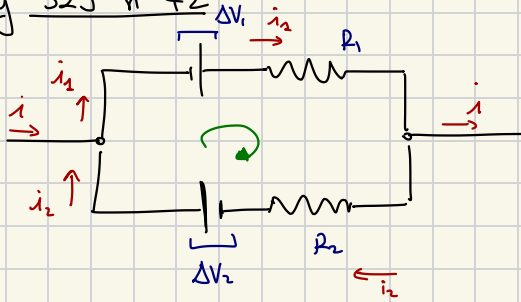


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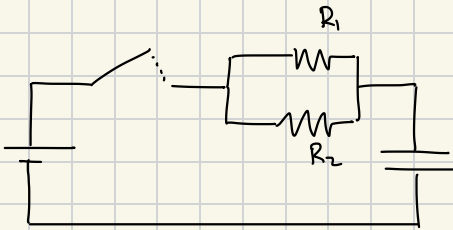
$$\begin{aligned} i &= 20 \text{ A} \\ \Delta V_1 &= 100 \text{ V} \\ \Delta V_2 &= 200 \text{ V} \\ R_1 &= 10 \, \Omega \\ R_2 &= 30 \, \Omega \end{aligned}$$

$$\begin{cases} i + i_2 = i_1 \\ \Delta V_1 - i_2 R_1 - i_2 R_2 + \Delta V_2 = 0 \end{cases} \quad \begin{array}{l} \text{I legge} \\ \text{II legge} \end{array}$$

$$\begin{cases} 20 + i_2 = i_1 \\ 100 - (20 + i_2) \cdot 10 - i_2 \cdot 30 + 200 = 0 \end{cases}$$

$$10 - 20 - i_2 - 3i_2 + 20 = 0 \quad i_2 = \frac{10}{4} = \frac{5}{2} = 2,5 \text{ A}$$

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$$\begin{aligned} C &= 3,91 \, \mu\text{F} \\ R_1 &= 420 \, \Omega \\ R_2 &= 560 \, \Omega \end{aligned}$$

$$Q(0) = 0 \quad t_f \text{ in modo che } Q(t_f) = \frac{3}{4} Q_{\max}$$

$$Q(t) = C \mathcal{E}_{\text{em}} \left( 1 - e^{-\frac{t}{RC}} \right) \quad \text{ma } R = R_{\text{eq}} \quad \text{e so da } \frac{1}{R_{\text{eq}}} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$Q_{\max} = \lim_{t \rightarrow +\infty} (C \mathcal{E}_{\text{em}} (1 - e^{-\frac{t}{RC}})) = C \mathcal{E}_{\text{em}}$$

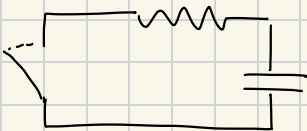
$$C \mathcal{E}_{\text{em}} \left( 1 - e^{-\frac{t_f}{RC}} \right) = \frac{3}{4} C \mathcal{E}_{\text{em}}$$

$$1 - e^{-\frac{t_f}{RC}} = \frac{3}{4} \quad \leadsto \quad \frac{1}{4} = e^{-\frac{t_f}{RC}}$$

$$\ln\left(\frac{1}{4}\right) = -\frac{t_f}{RC} \quad \leadsto \quad t_f = -RC \ln\left(\frac{1}{4}\right)$$

$$\leadsto t_f = RC \ln(4)$$

105 :



$$t_p = 1,42 \text{ ms}$$

$$Q(t_p) = \frac{40}{100} Q_{\text{iniziale}}$$

tempo caratteristico = ? = RC

$$Q(t) = Q_{\text{max}} e^{-t/RC} \quad \text{Scarica del condensatore}$$

$$Q(0) = Q_{\text{iniziale}} = Q_{\text{max}} \cdot e^0 = Q_{\text{max}}$$

$$Q_{\text{max}} \cdot e^{-t_p/RC} = \frac{4}{10} Q_{\text{max}}$$

$$-\frac{t_p}{RC} = \ln\left(\frac{2}{5}\right)$$

$$RC = -\frac{t_p}{\ln\left(\frac{2}{5}\right)} = \frac{t_p}{\ln(5) - \ln(2)}$$

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$$R_{\text{eq}} = R_1 + \frac{R_2 R_3}{R_2 + R_3} + \frac{R_4 R_5}{R_4 + R_5}$$



$$R_1 = 200 \, \Omega$$

$$R_2 = 600 \, \Omega$$

$$R_3 = 400 \, \Omega$$

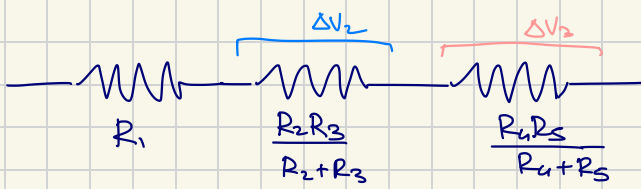
$$R_4 = R_5 = 120 \, \Omega$$

▷ Disegna il circuito associato

$$\triangleright \Delta V = ? \quad i = 440 \text{ mA}$$

$$\Delta V = i R_{\text{eq}}$$

Dino :



$$\frac{1}{R_{2,3}} = \frac{1}{R_2} + \frac{1}{R_3} \quad \text{se sono in parallelo} \quad \Rightarrow \quad \frac{1}{R_{2,3}} = \frac{R_3 + R_2}{R_2 R_3}$$

$$\Rightarrow \quad R_{2,3} = \frac{R_2 R_3}{R_2 + R_3}$$

