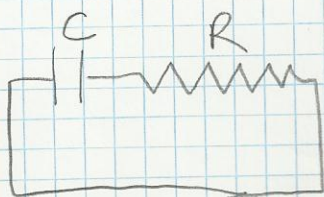


24 GENNAIO 2011

1) $C = 100 \mu F$ $q = 50 mC$ $R = 2 \cdot 10^4 \Omega$



$$T = - \ln \left(\frac{V_F}{V_I} \right) \cdot \tau$$

$$\tau = RC \rightarrow \tau = 100 \cdot 10^{-6} \times 2 \times 10^4$$

$$\tau = 100 \times 2 \times 10^{-2}$$

$$\tau = 2$$

$$T = - \ln \left(\frac{1}{10} \right) \cdot 2 =$$

TENSIONE INIZIALE CONDENSATORE $\rightarrow \frac{50 mC}{C} =$

$$\frac{50 \times 10^{-3}}{100 \cdot 10^{-6}} = \frac{50 \times 10^{-3} \times 10^6}{100} = \frac{1}{2} \times 10^3 = 0,5 \times 10^3 = 500$$

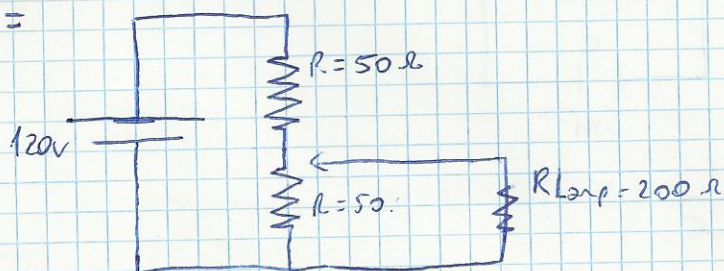
TENSIONE FINALE $\left(\frac{1}{10} \right) = \frac{500}{10} = 50 V$

$$T = - \ln \left(\frac{1}{10} \right) \cdot 2 = 4,6 s.$$

$$b) \frac{Q^2}{C^2 R} = W$$

2) con $X = 2,5 \rightarrow X = \frac{1}{2} \rightarrow R_{poT} = 100 \cdot \frac{1}{2} = 50 \Omega$

CIRCUITO EQUIVALENTE =



2)

POTENZA CIRCUITO

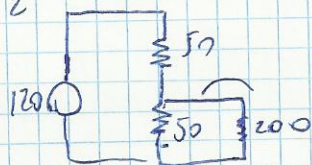
$$R_{eq} = \frac{1}{50} + \frac{1}{200} = \frac{5}{200} = \frac{1}{40} = 40 \Omega$$

$$R_{eqT} = 40 + 50 = 90 \Omega$$

$$P = \frac{V^2}{R} = 160 W$$

$$= \frac{120^2}{90} = 160 W$$

b) POTENZA LAMPADINA $X = \frac{1}{2}$



$$R_{eq} = \frac{1}{50} + \frac{1}{200} = \frac{5}{200} = 40 \Omega$$

$$DOP_{L10} = \frac{E \cdot 40}{40 + 90}$$

$$DOP = 53,3 V$$

$$P_{OT} = \frac{53,3^2}{200} = 14,2 \text{ W}$$

POTENZA LAMPADINA $X=1$

CIRCUITO equivalente

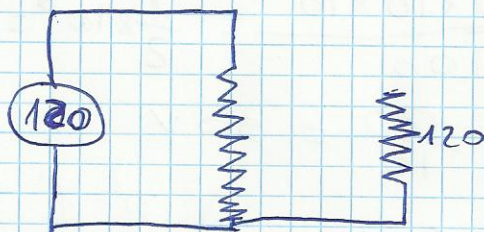


DDP = 120V (paraleli)
stessa DDP

$$P = \frac{120^2}{200} = 72 \text{ W}$$

POTENZA LAMPADINA $X=0$

CIRCUITO equiv.



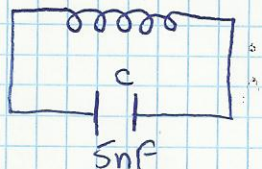
$P=0$ // circuito della lampadina non si chiude.

3

$$C = 5 \text{ nF}$$

caricato a 100V

$$C = 5 \times 10^{-9} \text{ F}$$



$$\omega^2 = \frac{1}{LC} \quad (2\pi \cdot 10 \text{ KHz})^2 = \frac{1}{L \times 5 \times 10^{-9}}$$

$$L \cdot 5 \times 10^{-9} = \frac{1}{(2\pi \cdot 10 \text{ KHz})^2}$$

$$L = \frac{5 \times 10^{-9}}{(2\pi \cdot 10^4)^2}$$

$$\omega = 2\pi F$$

$$F = 10 \text{ KHz} \quad 10 \cdot 10^3 \text{ Hz}$$

$$5 \times 10^{-16}$$

$$q = C V \cdot \cos(\omega t)$$

$$\rightarrow 2,5 \times 10^{-5} \text{ y}$$