

Notas

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30.35

Datos

$$\Delta V = 12 \text{ V}$$

$$C = 6 \cdot 10^{-5} \text{ F}$$

$$L = 1.5 \text{ H}$$

$$\omega = 105 \text{ rad/s}$$

$$q_0 = 7.2 \cdot 10^{-4} \text{ C}$$

$$U_{oc} = 12 \text{ V}$$

$$C$$

$$a) \omega = \frac{1}{\sqrt{LC}} = \frac{1}{\sqrt{(1.5)(6 \cdot 10^{-5})}} = 105 \text{ rad/s}$$

$$T = \frac{2\pi}{\omega} = \frac{2(3.14)}{105} = 0.0596 \text{ s}$$

$$b) C = \frac{q}{\Delta V} \Rightarrow q = C \Delta V = (6 \cdot 10^{-5})(12) \\ q = 7.2 \cdot 10^{-4} \text{ C}$$

$$c) U = \frac{1}{2} C V^2 = \frac{1}{2} (6 \cdot 10^{-5})(12)^2 = 4.32 \cdot 10^{-3} \text{ J}$$

$$d) q = Q \cos(\omega t + \phi) \\ q(0.023) = 7.2 \cdot 10^{-4} \cos(105(0.023)) = -5.42 \cdot 10^{-4} \text{ C} \\ q(0.023) = -5.42 \cdot 10^{-4} \text{ C}$$

$$e) i = \frac{dq}{dt} = -\omega Q \sin(\omega t + \phi)$$

$$i = -(105)(7.2 \cdot 10^{-4}) \sin(105(0.023)) = -0.05 \text{ A}$$

$$f) U_C = \frac{q^2}{2C} = \frac{(-5.42 \cdot 10^{-4})^2}{2(6 \cdot 10^{-5})} = 2.45 \cdot 10^{-3} \text{ J}$$

$$U_L = \frac{1}{2} L i^2 = \frac{1}{2} (1.5)(0.05)^2 = 1.87 \cdot 10^{-3} \text{ J}$$