

Answer on Question #53046-Physics- Electric Circuits

1. A serial circuit with resistor of 600 ohm and capacity of $4\mu F$ is connected to the source of alternating circuit of 100 V with a voltage equation $V=Vm \sin 250t$. The magnitude of inductor that must be serially installed to the circuit in order to flow the current of 100mA is...H

- A.0.1
- B.0.2
- C.0.4
- D.0.8
- E.1

Solution

$$Z = \frac{100V}{0.1A} = 1000 \text{ ohm.}$$

$$1000 = \sqrt{600^2 + X^2} \rightarrow X = \sqrt{1000^2 - 600^2} = 800 \text{ ohm.}$$

$$X_c = \frac{10^6}{250 \cdot 4} = 10^3 \text{ ohm}$$

$$X = 800 = X_c - X_L \rightarrow X_L = X_c - 800 = (1000 - 800) \text{ ohm} = 200 \text{ ohm} = \omega L = 250L$$

$$L = \frac{200}{250} = 0.80 \text{ H.}$$

Answer: D. 0.8.

2. A straight wire of 120 cm carries directional current of 0.25A. If the space is affected by magnetic field of 0.5T that perpendicular to the current, thus the magnitude of Lorentz force of the wire is...

- A.0.15N
- B.0.30N
- C.0.60N
- D.30N
- E.60N

Solution

$$F = BIL \sin \alpha = 0.5T \cdot 0.25A \cdot 1.2 \text{ m} \sin 90 = 0.15 \text{ N.}$$

Answer: A. 0.15N.

3. Magnetic flux produced by magnetic field B that through perpendicularly a surface of width A is P. If the magnetic field is reduced into B/2, but the width surface enlarged to 2A, then flux produced is...

A.P/4

B.P/2

C.P

D.2P

E.4P

Solution

Magnetic flux is

$$\Phi = B'A' = \left(\frac{B}{2}\right)(2A) = BA = P.$$

Answer: C. P.

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