

Alternating Current

1. Alternating voltage (V) is represented by the equation

(a) $V(t) = V_m e^{\omega t}$

(b) $V(t) = V_m \sin \omega t$

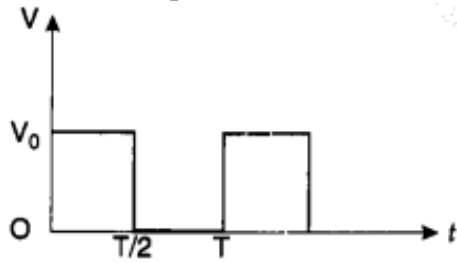
(c) $V(t) = V_m \cot \omega t$

(d) $V(t) = V_m \tan \omega t$

▼ **Answer**

Answer: b

2. The rms value of potential difference V shown in the figure is

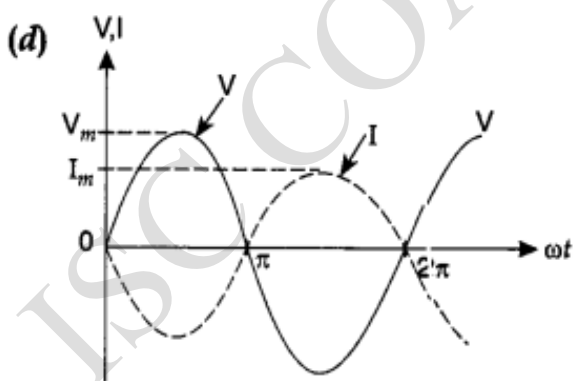
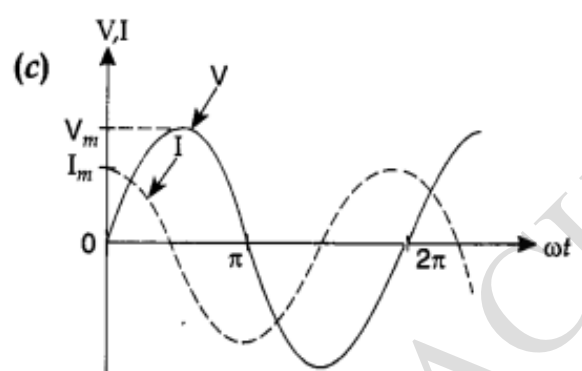
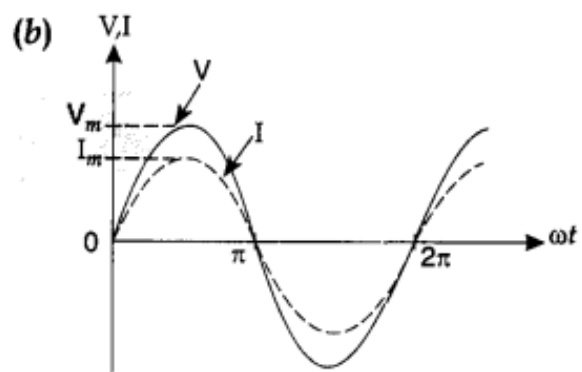
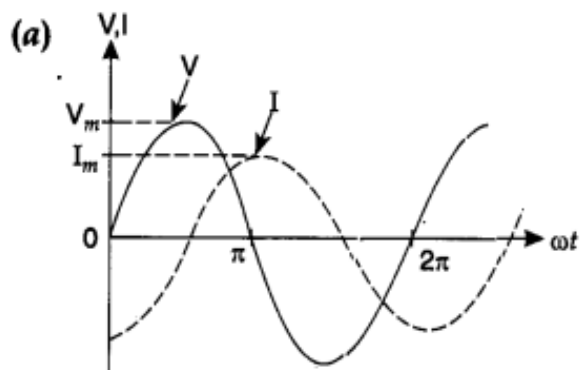


- (a) $\frac{V_0}{\sqrt{3}}$ (b) V_0 (c) $\frac{V_0}{\sqrt{2}}$ (d) $\frac{V_0}{2}$

▼ Answer

Answer: c

3. The phase relationship between current and voltage in a pure resistive circuit is best represented by



▼ Answer

Answer: b

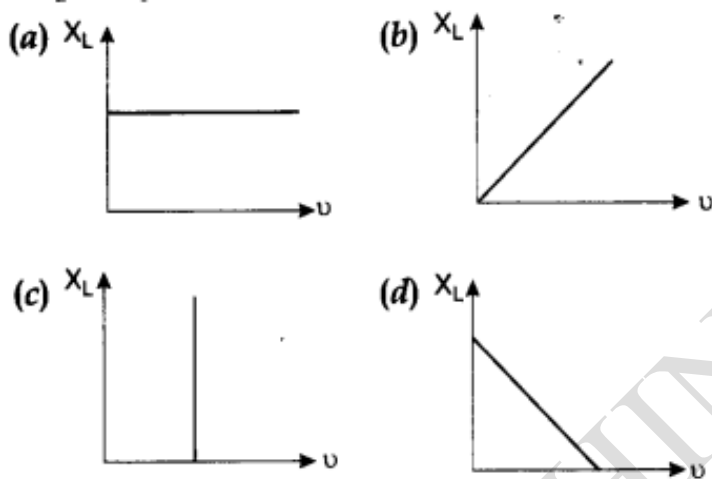
4. In the case of an inductor

- (a) voltage lags the current by $\frac{\pi}{2}$
- (b) voltage leads the current by $\frac{\pi}{2}$
- (c) voltage leads the current by $\frac{\pi}{3}$
- (d) voltage leads the current by $\frac{\pi}{4}$

▼ Answer

Answer: b

5. Which of the following graphs represents the correct variation of inductive reactance X_L with frequency ν ?



▼ Answer

Answer: b

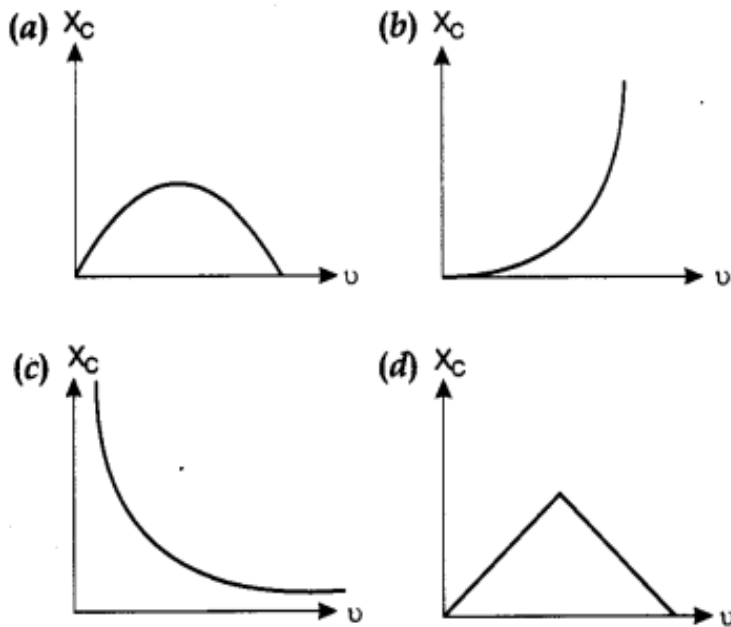
6. In a pure capacitive circuit if the frequency of ac source is doubled, then its capacitive reactance will be

- (a) remains same
- (b) doubled
- (c) halved
- (d) zero

▼ Answer

Answer: c

7. Which of the following graphs represents the correct variation of capacitive reactance X_c with frequency ν ?



▼ **Answer**

Answer: c

8. In an alternating current circuit consisting of elements in series, the current increases on increasing the frequency of supply. Which of the following elements are likely to constitute the circuit?

- (a) Only resistor
- (b) Resistor and inductor
- (c) Resistor and capacitor
- (d) Only inductor

▼ **Answer**

Answer: c

9. In which of the following circuits the maximum power dissipation is observed?

- (a) Pure capacitive circuit
- (b) Pure inductive circuit
- (c) Pure resistive circuit
- (d) None of these

▼ **Answer**

Answer: c

10. In series LCR circuit, the phase angle between supply voltage and current is

(a) $\tan \phi = \frac{X_L - X_C}{R}$ (b) $\tan \phi = \frac{R}{X_L - X_C}$

(c) $\tan \phi = \frac{R}{X_L + X_C}$ (d) $\tan \phi = \frac{X_L + X_C}{R}$

▼ Answer

Answer: a

11. In a series LCR circuit the voltage across an inductor, capacitor and resistor are 20 V, 20 V and 40 V respectively. The phase difference between the applied voltage and the current in the circuit is

- (a) 30°
- (b) 45°
- (c) 60°
- (d) 0°

▼ Answer

Answer: d

12. At resonance frequency the impedance in series LCR circuit is

- (a) maximum
- (b) minimum
- (c) zero
- (d) infinity

▼ Answer

Answer: b

13. At resonant frequency the current amplitude in series LCR circuit is

- (a) maximum
- (b) minimum
- (c) zero
- (d) infinity

▼ Answer

Answer: a

14. Quality factor and power factor both have the dimensions of

- (a) time
- (b) frequency

- (c) work
- (d) angle

▼ **Answer**

Answer: d

15. The natural frequency (ω_0) of oscillations in LC circuit is given by

- (a) $\frac{1}{2\pi} \frac{1}{\sqrt{LC}}$
- (b) $\frac{1}{\pi} \frac{1}{\sqrt{2LC}}$
- (c) $\frac{1}{\sqrt{LC}}$
- (d) $\sqrt{LC}$

▼ **Answer**

Answer: c

16. A transformer works on the principle of

- (a) self induction
- (b) electrical inertia
- (c) mutual induction
- (d) magnetic effect of the electrical current

▼ **Answer**

Answer: c

17. For an ideal-step-down transformer, the quantity which is constant for both the coils is

- (a) current in the coils
- (b) voltage across the coils
- (c) resistance of coils
- (d) power in the coils

▼ **Answer**

Answer: d
