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

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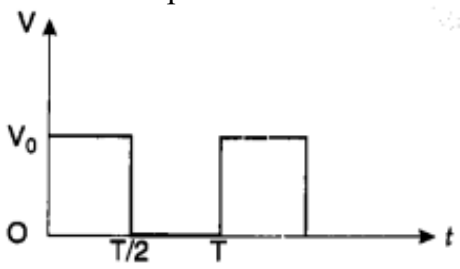
2. The rms value of potential difference V shown in the figure is



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

▼ **Answer**

Answer: c

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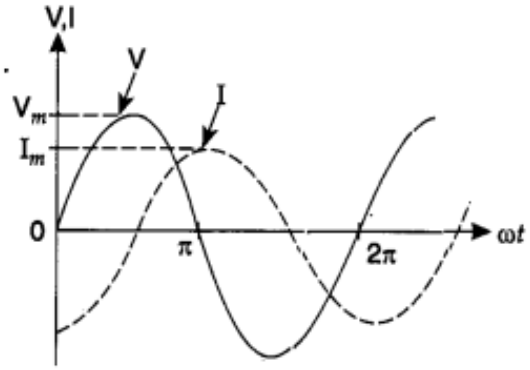
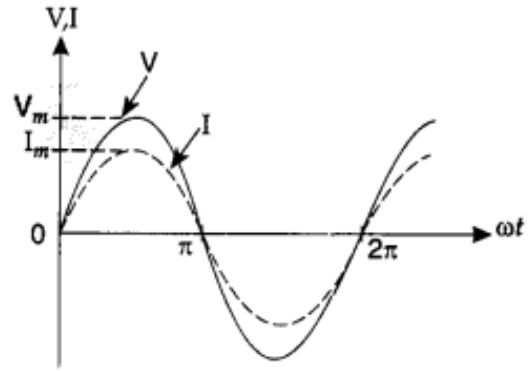
3. The phase relationship between current and voltage in a pure resistive circuit is best represented by

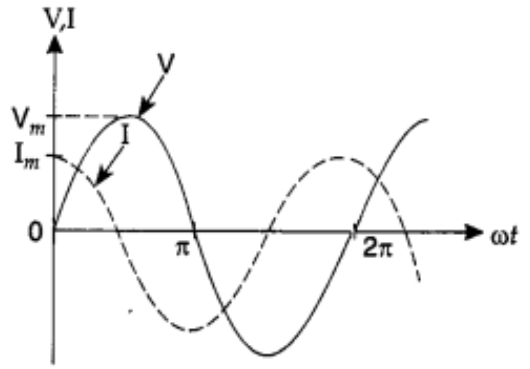
(a)



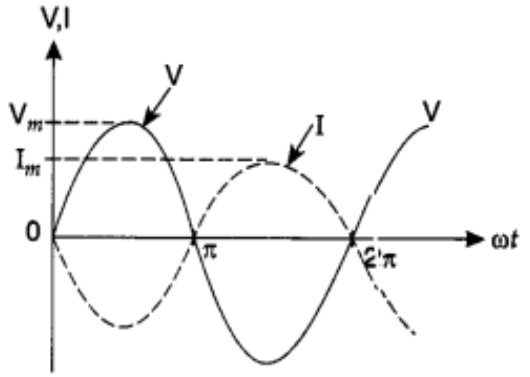
(b)



(c)



(d)



▼ **Answer**

Answer: b

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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

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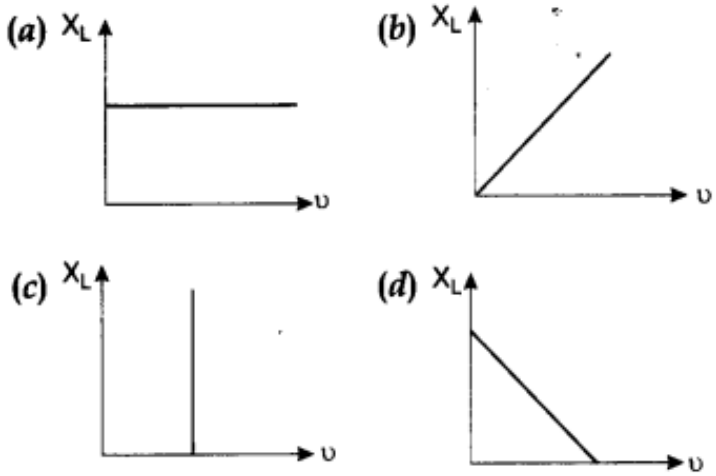
5. Which of the following graphs represents the correct variation of inductive reactance X_L with frequency u?



▼ **Answer**

Answer: b

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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

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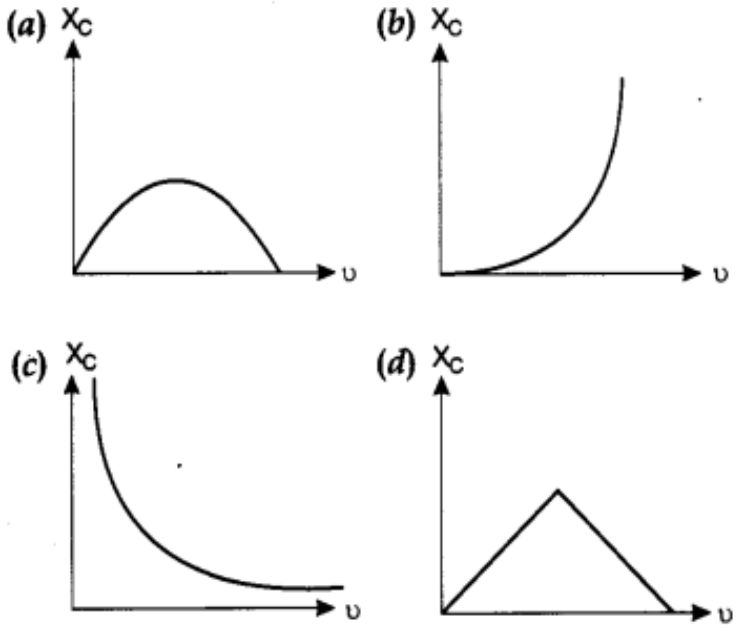
7. Which of the following graphs represents the correct variation of capacitive reactance Xc with frequency v u?



▼ **Answer**

Answer: c

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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

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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

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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

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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

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12. At resonance frequency the impedance in series LCR circuit is
(a) maximum
(b) minimum
(c) zero
(d) infinity

▼ **Answer**

Answer: b

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13. At resonant frequency the current amplitude in series LCR circuit is
(a) maximum
(b) minimum
(c) zero
(d) infinity

▼ **Answer**

Answer: a

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14. Quality factor and power factor both have the dimensions of
(a) time
(b) frequency

(c) work
(d) angle

▼ **Answer**

Answer: d

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15. The natural frequency (ca0) 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

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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

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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
