(PHYSICS) **ALTERNATING CURRENT**

DPP – 01
CLASS – 12th
TOPIC – REVISION-01

Q.1 In a series LR-circuit, the inductive reactance is equal to the resistance R of the circuit. An emf $E=E_o\cos(\omega t)$ is applied to the circuit. The power consumed in the circuit is

(a) E_0^2/R

(b) $E_0^2/2R$

(c) $E_0^2/4R$

(d) $E_0^2/8R$

Q.2 One 60 V,100 W bulb is to be connected to 100 V,50 Hzac- source. The potential drop across the inductor is (f=50 Hz)

(a) 80 V

(b) 40 V

(c) 10 V

(d) 20 V

Q.3 An AC voltage source of variable angular frequency and fixed amplitude V connected in series with a capacitance C and an electric bulb of resistance R (inductance zero). When is increased

(a) The bulb glows dimmer

(b) The bulb glows brighter

(c) Net impedance of circuit is unchanged

(d) Total impedance of the circuit increases

Q.4 An alternating e. m. f. of angular frequency ω is applied across an inductance. The instantaneous power developed across it has an angular frequency

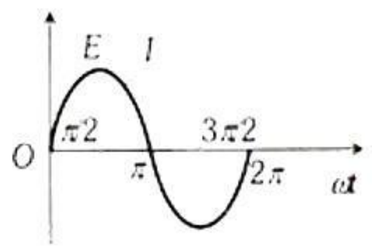
(a) $\omega/4$

(b) $\omega/2$

(c) ω

(d) 2ω

Q.5 The variation of the instantaneous current I(t) and the instantaneous emf E (t) in a circuit is as shown in the following fig. Which of the following statements is correct



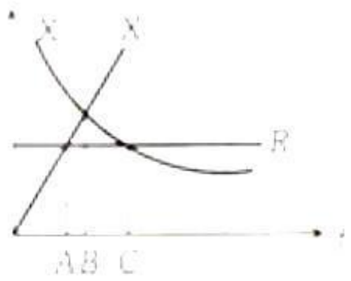
(a) The voltage lags behind the current by π/2

(b) The voltage leads the current by π/2

(c) The voltage and the current are in phase

(d) The voltage leads the current by π

Q.6 The figure shows variation of R,X_L and X_c with frequency f in a series L,C,R circuit. Then for what frequency point, the circuit is inductive.



(a) A

(b) B

(c) C

(d) A and B

Q.7 When AC source is connected across seris R-C combination, the ac- current may lead ac-voltage by

(a) 0°

(b) 180°

(c) 30°

(d) 90°

Q.8 In a purely resistive a .c. circuit, the current

(a) is in phase with the e .m. f.

(b) leads the e. m .f. by a difference of $\pi_{radians}$ phase

(c) leads the e .m .f. by a phase difference of π/2 radians

(d) lags behind the e .m .f. by phase difference of π/4 radians

Q.9 A capacitor of capacitance C has reactance X. If capacitance and frequency become double, then the capacitive reactance will be

(a) 2X

(b) 4X

(c) X/2

(d) X/4

Q.10 Reactance of a capacitor of capacitance C for an alternating current of frequency $400/\pi$ Hz is 25Ω. The value of C is

(a) 25μF

(b) 50μF

(c) 75μF

(d) 100μF

Q.11 The core of a transformer is laminated, so as to

(a) make it light weight

(b) make it robust and strong

(c) increase the secondary voltage

(d) reduce energy loss due to eddy current

Q.12 The ratio of no. of turns of primary coil to secondary coil in a transformer is 2:3. If a cell of 6 V is connected across the primary coil, then voltage across the secondary coil will be

(a) 3 V

(b) 6 V

(c) 9 V

(d) 12 V

Q.13 In a transformer, the no. of turns of primary and secondary coil are 500 and 400 respectively. If 220 V is supplied to the primary coil, then ratio of currents in primary and secondary coils is

(a) 4:5

(b) 5:4

(c) 5:9

(d) 9:5

Q.14 220 V,50 Hz, AC is applied to a resistor. The instantaneous value of voltage is

(a) $220\sqrt{2}\ \sin 100\pi t$

(b) $220\ \sin 100\pi t$

(c) $220\sqrt{2}\ \sin 50\pi t$

(d) $220\ \sin 50\pi t$

Q.15 An inductance and a resistance are connected in series with an AC potential. In this circuit

(a) the current and the potential difference across the resistance lead the PD across the inductance by phase angle $\pi/2$

(b) the current and the potential difference across the resistance lag behind PD across the inductance by an angle $\pi/2$

(c) the current and the potential difference across the resistance lag behind the PD across the inductance by an angle π

(d) the PD across the resistance lags behind the PD across the inductance by an angle $\pi/2$ but the current in the resistance leads the PD across inductance by $\pi/2$

Q.16 An AC voltage is applied to a resistance R and an inductor L in series. If R and the inductive reactance are both equal to 3Ω, the phase difference (in rad) between the applied voltage and the current in the circuit is

(a) $\pi/4$

(b) $\pi/2$

(c) zero

(d) $\pi/6$

Q.17 In a circuit containing R and L, as the frequency of the impressed AC increases, the impedance of the circuit

(a) decreases

(b) increases

(c) remains unchanged

(d) first increases and then decreases

Q.18 When an AC voltage is applied to an L-C-R circuit, then

(a) I and V are out of phase with each other in R

(b) I and V are in phase in L with in C, they are out of phase

(c) I and V are out of phase in both, C and L

(d) I and V are out of phase in L and in phase in C

Q.19 In a L-C-R series circuit, the potential difference between the terminals of the inductance is 60 V, between the terminals of the capacitor is 30 V and that across the resistance is 40 V. Then, supply voltage will be equal to the

(a) 50 V

(b) 70 V

(c) 130 V

(d) 10 V

Q.20 An L-C-R series circuit, connected to a source E, is at resonance. Then,

(a) the voltage across R is zero

(b) the voltage across R equals applied voltage

(c) the voltage across C is zero

(d) the voltage across C equals applied voltage

Q.21 A sinusoidal voltage of peak value 300 V and an angular frequency ω=400 rads^{-1} is applied to series L-C-R circuit, in which R=3Ω,L=20mH and C=625μF The peak current in the circuit is

(a) $30\sqrt{2}$ A

(b) 60 A

(c) 100 A

(d) $60\sqrt{2}$ A

SOLUTION

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Sol.1 (C)

Sol.2 (A)

Sol.3 (B)

Sol.4 (D)

Sol.5 (B)

Sol.6 (C)

Sol.7 (C)

Sol.8 (A)

Sol.9 (D)

Sol.10 (D)

Sol.11 (D)

Sol.12 (C)

Sol.13 (A)

Sol.14 (A)

Sol.15 (B)

Sol.16 (A)

Sol.17 (B)

Sol.18 (C)

Sol.19 (A)

Sol.20 (B)

Sol.21 (B)