SHAHEEN GROUP OF INSTITUTIONS
Bidar (Head Office)

Class : NEET Repeaters Sub: Physics Worksheet–19 Date: 9-02-2019

Alternating Current-1

1. A current in circuit is given by i = 3 + 4 sin ωt. Then the effective value of current is
   (A) 5 (B) $\sqrt{7}$ (C) $\sqrt{17}$ (D) $\sqrt{10}$

2. The relation between an A.C. voltage source and time in SI units is V = 120sin(100πt) cos(100πt) volt value of peak voltage and frequency will be respectively
   (A) 120 volt and 100 Hz (B) $\frac{120}{\sqrt{2}}$ volt and 100 Hz
   (C) 60 volt and 200 Hz (D) 60 volt and 100 Hz

3. If an A.C. main supply is given to be 220 V. What would be the average e.m.f. during a positive half cycle
   (A) 198 V (B) 386 V (C) 256 V (D) None of these

4. A 12 ohm resistor and a 0.21 henry inductor are connected in series to an AC source operating at 20 volts, 50 cycle/second. The phase angle between the current and the source voltage is
   (A) 30^o (B) 40^o (C) 80^o (D) 90^o

5. A 110 V, 60 W lamp is run from a 220 V AC main using a capacitor in series with the lamp, instead of a resistor then the voltage across the capacitor is about
   (A) 110 V (B) 190 V (C) 220 V (D) 311 V

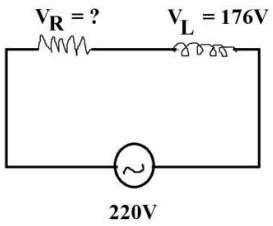
6. An inductive circuit contains resistance of 10 ohms and an inductance of 20H. If an A.C. voltage of 120 volt and frequency 60 Hz is applied to this circuit, the current would be nearly
   (A) 0.016 amp. (B) 0.16 amp. (C) 0.48 amp. (D) 0.80 amp.

7. A student connects a long air cored-coil of manganin wire to a 100 V D.C. supply and records a current of 25 amp. When the same coil connected across 100 V. 50 Hz. a.c. the current reduces to 20A. The reactance of the coil is
   (A) 4Ω (B) 3Ω (C) 5Ω (D) None

8. An a.c. source of voltage V and of frequency 50Hz is connected to an inductor of 2 H and negligible resistance. A current of r.m.s. value I flows in the coil. When the frequency of the voltage is changed to 400 Hz keeping the magnitude of V the same, the current is now
(A) 8 I in phase with V (B) 4 I and lagging by 90^o from V
(C) $\frac{I}{4}$ and lagging by 90^o from V (D) $\frac{I}{8}$ and lagging by 90^o from V

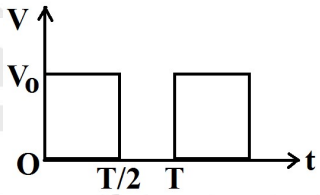
9. If the current through an inductor of inductance L is given by $I = I_o \sin \omega t$, then the voltage across inductor will be
(A) $I_o \omega t \sin (\omega t - \pi/2)$ (B) $I_o \omega t \sin (\omega t + \pi/2)$
(C) $I_o \omega L \sin (\omega t - \pi)$ (D) None of these

10. In showing figure find V_R :
(A) 132V (B) 396V
(C) 185V (D) $\sqrt{200 \times 176V}$



11. In an ac circuit an alternating voltage $e=200\sqrt{2}$ sin 100 t volts is connected to a capacitor of capacity 1μF. The r.m.s. value of the current in the circuit is
(A) 10 mA (B) 100 mA (C) 200 mA (D) 20 mA

12. The r.m.s. value of potential difference V shown in the figure is
(A) $\frac{V_o}{\sqrt{3}}$ (B) V_o
(C) $\frac{V_o}{\sqrt{2}}$ (D) $\frac{V_o}{2}$



13. A coil has resistance 30 ohm and inductive reactance 20 ohm at 50 Hz frequency, If an ac source, of 200 volt, 100 Hz, is connected across the coil, the current in the coil will be
(A) 2.0 A (B) 4.0 A (C) 8.0 A (D) $\frac{20}{\sqrt{13}}$ A

14. A coil of self-inductance L is connected in series with a bulb B and an AC source. Brightness of the bulb decreases when;
(A) an iron rod is inserted in the coil.
(B) frequency of the AC source is decreased.
(C) number of turns in the coil is reduced.
(D) A capacitance of reactance $X_C = X_L$ is included in the same circuit.

15. An alternating emf of angular frequency ω is applied across an inductance. The instantaneous power developed in the circuit has an angular frequency
(A) ω/4 (B) ω/2 (C) ω (D) 2ω

Physics Worksheet–19				Alternating Current-1									09-02-2019
1-C	2-D	3-A	4-C	5-B	6-A	7-B	8-D	9-B	10-A	11-D	12-C	13-B	14-A	15-D