

DPP

DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Subject : PHYSICS
DPP No. :2

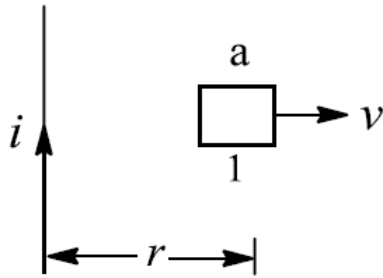
Topic :-Alternating Current

- The power factor of an AC circuit having resistance R and inductance L (connected in series) and an angular velocity ω is
 - $R/\omega L$
 - $R/(R^2 + \omega^2 L^2)^{1/2}$
 - $\omega L/R$
 - $R/(R^2 - \omega^2 L^2)^{1/2}$
- A uniformly wound solenoidal coil of self inductance 1.8×10^{-4} H and resistance 6Ω is broken up into two identical coils. These identical coils are then connected in parallel across a 12 V battery of negligible resistance. The time constant of the current in the circuit and the steady state current through battery is
 - 3×10^{-5} s, 8 A
 - 1.5×10^{-5} s, 8 A
 - 0.75×10^{-4} s, 4 A
 - 6×10^{-5} s, 2 A
- An alternating voltage is connected in series with a resistance R and an inductance L . If the potential drop across the resistance is 200 V and across the inductance is 150 V, then the applied voltage is
 - 350 V
 - 250 V
 - 500 V
 - 300 V
- The number of turns in a secondary coil is twice the number of turns in primary. A leclanche cell of 1.5 V is connected across the primary. The voltage across secondary is
 - 1.5 V
 - 3.0 V
 - 240 V
 - Zero
- When the rate of change of current is unity, induced emf is equal to
 - Thickness of coil
 - Number of turns in coil
 - Coefficient of self-induction
 - Total flux linked with coil
- A coil of wire of certain radius has 100 turns and a self inductance of 15 mH. The self inductance of a second similar coil of 500 turns will be
 - 75 mH
 - 375 mH
 - 15 mH
 - None of these

7. The coefficient of induction of a choke coil is $0.1H$ and resistance is 12Ω . If it is connected to an alternating current source of frequency $60 Hz$, then power factor will be

- a) 0.32 b) 0.30 c) 0.28 d) 0.24

8. A square loop of side a placed in the same plane as a long straight wire carrying a current i . The centre of the loop is at a distance r from the wire, where $r \gg a$, figure. The loop is moved away from the wire with a constant velocity v . The induced emf in the loop is



- a) $\frac{\mu_0 i a v}{2 \pi r}$ b) $\frac{\mu_0 i a^3 v}{2 \pi r^3}$ c) $\frac{\mu_0 i v}{2 \pi}$ d) $\frac{\mu_0 i a^2 v}{2 \pi r^2}$

9. Voltage and current in an ac circuit are given by

$$V = 5 \sin \left(100\pi t - \frac{\pi}{6} \right) \text{ and } I = 4 \sin \left(100 \pi t + \frac{\pi}{6} \right)$$

- a) Voltage leads the current by 30° b) Current leads the voltage by 30°
 c) Current leads the voltage by 60° d) Voltage leads the current by 60°

10. A coil is wound on a core of rectangular cross-section. If all the linear dimensions of core are increased by a factor 2 and number of turns per unit length of coil remains same, the self-inductance increases by a factor of

- a) 16 b) 8 c) 4 d) 2

11. The phase angle between e.m.f. and current in LCR series as circuit is

- a) 0 to $\frac{\pi}{2}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{2}$ d) Π

12. The primary winding of a transformer has 200 turns and its secondary winding has 50 turns. If the current in the secondary winding is 40 A, the current in the primary is

- a) 10 A b) 80 A c) 160 A d) 800 A

13. The initial phase angle for $i = 10 \sin \omega t + 8 \cos \omega t$ is

- a) $\tan^{-1} \left(\frac{4}{5} \right)$ b) $\tan^{-1} \left(\frac{5}{4} \right)$ c) $\sin^{-1} \left(\frac{4}{5} \right)$ d) 90°

