DPP

DAILY PRACTICE PROBLEMS

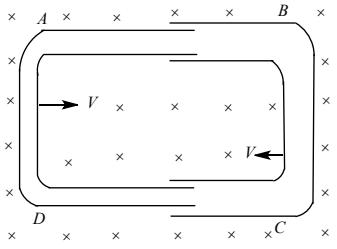
Class : XIIth **Subject : PHYSICS**

Date : **DPP No. : 8**

Topic :-Electro Magentic Induction

1. A square coil of $10^{-2}\ m^2$ area is placed perpendicular to a uniform magnetic field of intensity $10^3\ Wb/m^2$. The magnetic flux through the coil is
   a) 10 $weber$ b) $10^{-5} weber$ c) $10^5 weber$ d) 100 $weber$
2. A 50 mH coil carries a current of 2 A, the energy stored in joule is
   a) 1 b) 0.05 c) 10 d) 0.1
3. A 220-volt input is supplied to a transformer. The output circuit draws a current of 2.0 ampere at 440 volts. If the efficiency of the transformer is 80%, the current drawn by the primary windings of the transformer is
   a) 5.0 ampere b) 3.6 ampere c) 2.8 ampere d) 2.5 ampere
4. In a coil of self inductance 0.5 $henry$, the current varies at a constant rate from zero to 10 $amperes$ in 2 $seconds$. The e.m.f. generated in the coil is
   a) 10 $volts$ b) 5 $volts$ c) 2.5 $volts$ d) $1.25\ volts$
5. In an A.C. generator, when the plane of the armature is perpendicular to the magnetic field
   a) Both magnetic flux and emf are maximum
   b) Both magnetic flux and emf are zero
   c) Both magnetic flux and emf are half of their respective maximum values
   d) Magnetic flux is maximum and emf is zero

6. One conducting U-tube can slide inside another as shown in figure, maintaining electrical contacts between the tubes. The magnetic field B is perpendicular to the plane of the figure. If each tube moves towards the other at a constant speed v, then the emf induced in the circuit in terms of B, l and v, where l is the width of each tube, will be



   a) Blv b) $-Blv$ c) Zero d) 2 Blv

7. Lenz's law is expressed by the following formula (here $e =$ induced e.m.f., $\phi =$ magnetic flux in one turn and $N =$ number of turns)

a) $e = -\phi \frac{dN}{dt}$ b) $e = -N \frac{d\phi}{dt}$ c) $e = -\frac{d}{dt}\left(\frac{\phi}{N}\right)$ d) $e = N \frac{d\phi}{dt}$

8. In a uniform magnetic field of induction$B$, a wire in the form of semicircle of radius r rotates about the diameter of the circle with angular frequency ω. If the total resistance of the circuit is R, the mean power generated per period of rotation is

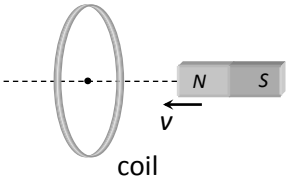
a) $\frac{B\pi r^2\omega}{2R}$ b) $\frac{(B\pi r^2\omega)^2}{5\,Rt}$ c) $\frac{(B\pi r\omega)^2}{2\,R}$ d) $\frac{(B\pi r\omega^2)^2}{8\,R}$

9. Lenz's law applies to

a) Electrostatics b) Lenses

c) Electro-magnetic induction d) Cinema slides

10. In the following figure, the magnet is moved towards the coil with a speed v and induced emf e . If magnet and coil recede away from one another each moving with speed v, the induced emf in the coil will be



a) e b) $2e$ c) $e/2$ d) $4e$

11. When a rod of length l is rotated with angular velocity of ω in a perpendicular field of induction B, about one end, the emf across its ends is

a) $Bl^2\omega$ b) $\frac{Bl^2\omega}{2}$ c) $Bl\omega$ d) $\frac{Bl\omega}{2}$

12. A LC circuit is in the state of resonance. If $C = 0.1\mu$F and $L = 0.25\ henry$, neglecting ohmic resistance of circuit what is the frequency of oscillations

a) 1007 Hz b) 100 Hz c) 109 Hz d) 500 Hz

13. When a metallic plate swings between the poles of magnet

a) No effect on the plate

b) Eddy currents are set up inside the plate and the direction of the current is along the motion of the plate

c) Eddy currents are set up inside the plate and the direction of the current oppose the motion of the plate

d) Eddy currents are set up inside the plate

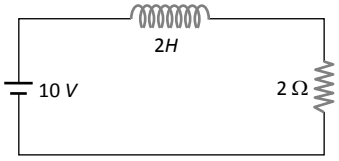
14. A rectangular coil of 20 turns and area of cross-section 25 $sqcm$ has resistance of 100 ohm. If a magnetic field which is perpendicular to the plane of the coil changes at the rate of 1000 $tesla$ per second, the current in the coil is

a) 1.0 $ampere$ b) 50 $ampere$ c) 0.5 $ampere$ d) 5.0 $ampere$

15. The wing span of an aeroplane is 36 m. If the plane is flaying at 400 kmh^{-1}, the emf induced between the wings tips is (assume $V = 4 \times 10^{-5}\ T$)

a) 16 V b) 1.6 V c) 0.16 V d) 0.016 V

16. The current passing through a choke coil of 5 henry is decreasing at the rate of 2 $ampere/sec$. The e.m.f. developing across the coil is
    a) 10 V b) -10 V c) 2.5 V d) -2.5 V
17. In the figure magnetic energy stored in the coil is



    a) Zero b) Infinite c) 25 $joules$ d) None of the above
18. If coil is open then L and R become
    a) ∞,0 b) 0,∞ c) ∞,∞ d) 0, 0
19. A magnet is brought towards a coil (i) speedly (ii) slowly, then the induced e.m.f/induced charge will be respectively
    a) More in first case/More in first case b) More in first case/Equal in both cases
    c) Less in first case/More in second case d) Less in first case/Equal in both cases
20. Armature current in dc motor will be maximum when
    a) Motor has acquired maximum speed b) Motor has acquired intermediate speed
    c) Motor has just started moving d) Motor is switched off