

Physics

1. A 800 turn coil of effective area 0.05 m^2 is kept perpendicular to a magnetic field $5 \times 10^{-5} \text{ T}$. When the plane of the coil is rotated by 90° around any of its coplanar axis in 0.1 s , the emf induced in the coil will be.

(a) 0.02 V
 (b) 2 V
 (c) 0.2 V
 (d) $2 \times 10^{-3} \text{ V}$

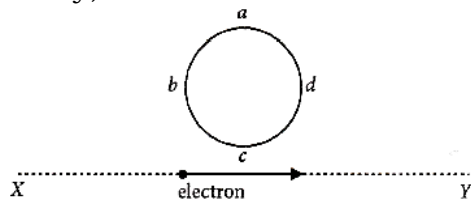
2. A conducting circular loop is placed in a uniform magnetic field, $B = 0.025 \text{ T}$ with its plane perpendicular to the loop. The radius of the loop is made to shrink at a constant rate of 1 mm s^{-1} . The induced emf when the radius is 2 cm , is

(a) $2\pi \mu\text{V}$
 (b) $\pi \mu\text{V}$
 (c) $\frac{\pi}{2} \mu\text{V}$
 (d) $2 \mu\text{V}$

3. A magnetic field of $2 \times 10^{-2} \text{ T}$ acts at right angles to a coil of area 100 cm^2 , with 50 turns. The average e.m.f. induced in the coil is 0.1 V , when it is removed from the field in $t \text{ sec}$. The value of t is.

(a) 10 s
 (b) 0.1 s
 (c) 0.01 s
 (d) 1 s

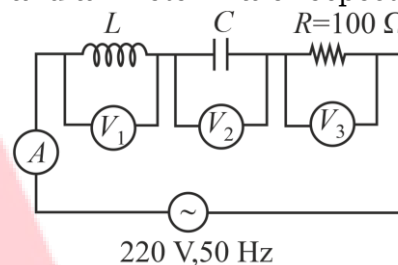
4. An electron moves on a straight-line path XY as shown. The abcd is a coil adjacent to the path of electron. What will be the direction of current, if any, induced in the coil?



- (a) The current will reverse its direction as the electron goes past the coil

(b) No current induced
 (c) abcd
 (d) adcb

5. In the given circuit the reading of voltmeter V_1 and V_2 are 300 volts each. The reading of the voltmeter V_3 and ammeter A are respectively.

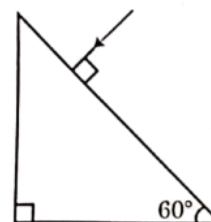


(a) 150 V , 2.2 A
 (b) 220 V , 2.2 A
 (c) 220 V , 2.0 A
 (d) 100 V , 2.0 A

6. An series L-C-R circuit is connected to a source of A.C. current. At resonance, the phase difference between the applied voltage and the current in the circuit is,

(a) π
 (b) zero
 (c) $\pi/4$
 (d) $\pi/2$

7. Find the value of the angle of emergence from the prism. Refractive index of the glass is $\sqrt{3}$.



(a) 90°
 (b) 60°
 (c) 30°
 (d) 45°

8. A charged particle having drift velocity of $7.5 \times 10^{-4} \text{ ms}^{-1}$ in an electric field of $3 \times 10^{-10} \text{ V m}^{-1}$, has a mobility in $\text{m}^2 \text{V}^{-1} \text{s}^{-1}$ of
- 2.25×10^{15}
 - 2.5×10^6
 - 2.5×10^{-6}
 - 2.25×10^{-15}
9. In order to increase the magnifying power of a compound microscope.
- The focal lengths of the objective and the eye piece should be small
 - Objective should have small focal length and the eye piece large
 - Both should have large focal lengths
 - The objective should have large focal length and eye piece should have small

10. Match the Column I and Column II

| | Column I | | Column II |
|-----|-------------------|-----|--|
| (A) | Forward bias | (1) | Due to concentration gradient across P and N side of a diode |
| (B) | Reverse bias | (2) | Due to flow of charges in the presence of electric field |
| (C) | Drift current | (3) | Width of depletion layer decreases |
| (D) | Diffusion current | (4) | Width of depletion layer increases |

- A-3, B-4, C-2, D-1
- A-4, B-3, C-2, D-1
- A-3, B-4, C-1, D-2
- A-1, B-4, C-2, D-3

Answer Key

Physics

S1.Ans.(a)
S2.Ans.(b)
S3.Ans.(b)
S4.Ans.(a)
S5.Ans.(b)
S6.Ans.(b)
S7.Ans.(b)
S8.Ans.(b)
S9.Ans.(a)
S10.Ans.(a)

