Resonance®
Educating for better tomorrow

TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

PHYSICS
DPP
DAILY PRACTICE PROBLEMS
DPP NO. 1

PHYSICS: EMF

DPP No. : 1

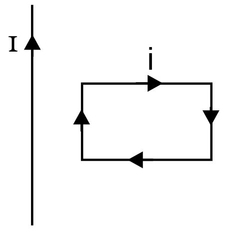
1. The magnetic field B at the centre of a square loop of side 'a', carrying a current i.

(1) $\frac{2\sqrt{2}\mu_0 i}{\pi a}$ (2) $\frac{2\mu_0 i}{\pi a}$ (3) $\frac{\sqrt{2}\mu_0 i}{\pi a}$ (4) zero

2. A charged particle is accelerated through a potential difference of 24 kV and acquires a speed of 2×10^6 m/s. It is then injected perpendicularly into a magnetic field of strength 0.2 T. Then the radius of the circle described by it is ?

(1) 6 cm (2) 12 cm (3) 18 cm (4) 30 cm

3. A rectangular loop carrying a current i is situated near a long straight wire such that the wire is parallel to one of the sides of the loop and the plane of the loop is same of the left wire. If a steady current I is established in the wire as shown in the (fig) the loop will -



(1) Rotate about an axis parallel to the wire
(2) Move away from the wire
(3) Move towards the wire
(4) Remain stationary.

4. A circular coil of radius 20 cm and 20 turns of wire is mounted vertically with its plane in magnetic meridian. A small magnetic needle (free to rotate about vertical axis) is placed at the center of the coil. It is deflected through 45° when a current is passed through the coil and in equilibrium (Horizontal component of earth's field is 0.34×10^{-4} T). The current in coil is:

(1) $\frac{17}{10\pi}$ A (2) 6A (3) 6×10^{-3} A (4) $\frac{3}{50}$ A

5. A magnetic needle lying parallel to a magnetic field requires W units of work to turn it through 60º. The torque needed to maintain the needle in this position will be :

(1) $\sqrt{3}$ W (2) W (3) $(\sqrt{3}/2)$W (4) 2 W

6. The magnetic field due to a current carrying circular loop of radius 3 cm at a point on the axis at a distance of 4 cm from the centre is 54 μT. What will be its value at the centre of the loop ?

(1) 250 μT (2) 150 μT (3) 125 μT (4) 75 μT

7. The materials suitable for making electromagnets should have :

(1) high retentivity and high coercivity (2) low retentivity and low coercivity
(3) high retentivity and low coercivity (4) low retentivity and high coercivity

8. A charged particle with charge q enters a region of constant, uniform and mutually orthogonal fields $\vec{E}$ and $\vec{B}$ with a velocity $\vec{v}$ perpendicular to both $\vec{E}$ and $\vec{B}$, and comes out without any change in magnitude or direction of $\vec{v}$. Then :

(1) $\vec{v} = \vec{E} \times \vec{B} / B^2$ (2) $\vec{v} = \vec{E} \times \vec{E} / B^2$ (3) $\vec{v} = \vec{E} \times \vec{E} / E^2$ (4) $\vec{v} = \vec{B} \times \vec{E} / E^2$

9. A charged particle moves through a magnetic field perpendicular to its direction. Then :

(1) the momentum changes but the kinetic energy is constant
(2) both momentum and kinetic energy of the particle are not constant
(3) both, momentum and kinetic energy of the particle are constant
(4) kinetic energy changes but the momentum is constant

10. Two identical conducting wires AOB and COD are placed at right angles to each other. The wire AOB carries an electric current I_1 and COD carries a current I_2. The magnetic field on a point lying at a distance d from O, in a direction perpendicular to the plane of the wires AOB and COD, will be given by :

(1) $\frac{\mu_0}{2\pi}\left(\frac{I_1 + I_2}{d}\right)^{1/2}$ (2) $\frac{\mu_0}{2\pi d}\left(I_1^2 + I_2^2\right)^{1/2}$ (3) $\frac{\mu_0}{2\pi d}$ $(I_1 + I_2)$ (4) $\frac{\mu_0}{2\pi d}\left(I_1^2 + I_2^2\right)$