DPP

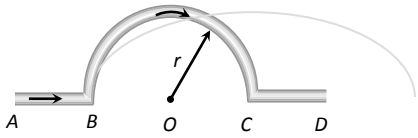
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**

Date : **DPP No. : 8**

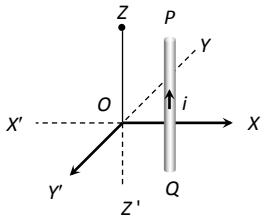
Topic :- MOVING CHARGES AND MAGNETISM

1. In the figure shown the magnetic induction at the centre of the arc due to the current in portion AB will be



a) $\frac{\mu_0 i}{r}$ b) $\frac{\mu_0 i}{2r}$ c) $\frac{\mu_0 i}{4r}$ d) Zero

2. A vertical wire kept in Z-X plane carries a current from Q to P (see figure). The magnetic field due to current will have the direction at the origin O along



a) OX b) OX' c) OY d) OY'

3. If the direction of the initial velocity of the charged particle is perpendicular to the magnetic field, then the orbit will be

Or

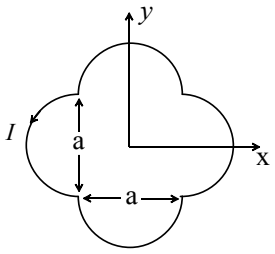
The path executed by a charged particle whose motion is perpendicular to magnetic field is

a) A straight line b) An ellipse c) A circle d) A helix

4. Magnetic field due to a ring having n turns at a distance x on its axis is proportional to (if $r =$ radius of ring)

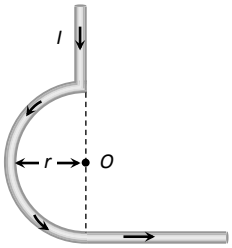
a) $\frac{r}{(x^2+r^2)}$ b) $\frac{r^2}{(x^2+r^2)^{3/2}}$ c) $\frac{nr^2}{(x^2+r^2)^{3/2}}$ d) $\frac{n^2r^2}{(x^2+r^2)^{3/2}}$

5. A loop carrying current I lies in the x-y plane as shown in the figure. The unit vector $\hat{k}$ is coming out of the plane of the paper. The magnetic moment of the current loop is



a) $a^2 I\hat{k}$ b) $\left(\frac{\pi}{2}+1\right)a^2 I\hat{k}$ c) $-\left(\frac{\pi}{2}+1\right)a^2 I\hat{k}$ d) $(2\pi+1)a^2 U\hat{k}$

6. In the figure, what is the magnetic field at the point O



a) $\frac{\mu_0 I}{4\pi r}$ b) $\frac{\mu_0 I}{4\pi r}+\frac{\mu_0 I}{2\pi r}$ c) $\frac{\mu_0 I}{4r}+\frac{\mu_0 I}{4\pi r}$ d) $\frac{\mu_0 I}{4r}+\frac{\mu_0 I}{4\pi r}$

7. A conductor in the form of a right angle ABC with $AB = 3\ cm$ amd $BC = 4\ cm$ carries a current of 10 A. There is a uniform magnetic field of 5 T perpendicular to the plane of the conductor. The force on the conductor will be
   a) 1.5 N b) 2.0 N c) 2.5 N d) 3.5 N
8. Two similar coils are kept mutually perpendicular such that their centres coincide. At the centre, find the ratio of the magnetic field due to one coil and the resultant magnetic field by both coils, if the same current is flown
   a) $1:\sqrt{2}$ b) 1 :2 c) 2 :1 d) $\sqrt{3}$:1
9. A circular coil carrying a current has a radius R. The ratio of magnetic induction at the centre of the coil and at a distance equal to $\sqrt{3}\ R$ from the centre of the coil on the axis is
   a) 1 : 1 b) 1 : 2 c) 2 : 1 d) 8 : 1
10. A particle of charge $-16 \times 10^{-18} coulomb$ moving with velocity 10 ms^{-1} along the x-axis enters a region where a magnetic field of induction B is along the y-axis, and an electric field of magnitude $10^4 V/m$ is along the negative z-axis. If the charged particle continues moving along the x-axis, the magnitude of B is
    a) $10^{-3} Wb/m^2$ b) $10^3 Wb/m^2$ c) $10^5 Wb/m^2$ d) $10^{16} Wb/m^2$
11. An electron is projected along the axis of a circular conductor carrying some current. Electron will experience force
    a) Along the axis b) Perpendicular to the axis
    c) At an angle of 4° with axis d) No force experienced

12. Imaging that an electron revolves round a circle of radius 5.3×10^{-11} m with a linear velocity of 7.5×10^{4} ms^{-1} in a hydrogen atom. The magnetic field produced at the centre of the circle due to the electron is
    a) 43 Wbm^{-2} b) 43×10^{2} Wbm^{-2} c) 0.43 Wbm^{-2} d) 43×10^{-4} Wbm^{-2}
13. A moving coil galvanometer gives full scale deflection, when a current of 0.005 A is passed through its coil. It is converted into a voltmeter reading upto 5V by using an external resistance of 975 Ω. What is the resistance of the galvanometer coil?
    a) 30 Ω b) 25 Ω c) 50 Ω d) 40 Ω
14. A circular loop of radius $0.0175m$ carries a current of 2.0 amp. The magnetic field at the centre of the loop is
    $(\mu_0 = 4\pi \times 10^{-7} weber/amp - m)$
    a) 1.57×10^{-5} $weber/m^2$ b) 8.0×10^{-5} $weber/m^2$
    c) 2.5×10^{-5} $weber/m^2$ d) 3.14×10^{-5} $weber/m^2$
15. An electron enters a region where electrostatic field is $20N/C$ and magnetic field is $5T$. If electron passes undeflected through the region, the velocity of electron will be
    a) $0.25ms^{-1}$ b) $2ms^{-1}$ c) $4ms^{-1}$ d) $8ms^{-1}$
16. A length of wire carries a steady current. It is bent first to form a circular coil of one turn. The same length is now bent more sharply to give a double loop of smaller radius. The magnetic field at the centre caused by the same current is
    a) Double of its first value b) Quarter of its first value
    c) Four times of its first value d) Same as the first value
17. A charged particle of mass m and charge q describes circular motion of radius r in a uniform magnetic field of strength B. The frequency of revolution is
    a) $\frac{Bq}{2\pi m}$ b) $\frac{Bq}{2\pi rm}$ c) $\frac{2\pi m}{Bq}$ d) $\frac{Bm}{2\pi q}$
18. A charged particle enters a magnetic field H with its initial velocity making an angle of 45° with H. The path of the particle will be
    a) A straight line b) A circle c) An ellipse d) A helix
19. The magnetic field near a current carrying conductor is given by
    a) Coulomb's law b) Lenz's law c) Biot-Savart's law d) Kirchhoff's law
20. A circular loop has a radius of 5 cm and it is carrying a current of 0.1 amp. Its magnetic moment is
    a) $1.32 \times 10^{-4} amp\text{-}m^2$ b) $2.62 \times 10^{-4} amp\text{-}m^2$ c) $5.25 \times 10^{-4} amp\text{-}m^2$ d) $7.85 \times 10^{-4} amp\text{-}m^2$