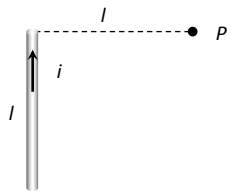
DPP
DAILY PRACTICE PROBLEMS

Class : XIIth **Subject : PHYSICS**
Date : **DPP No. : 9**

Topic :- MOVING CHARGES AND MAGNETISM

1. Figure shows a straight wire of length l carrying current i. The magnitude of a magnetic field produced by the current at point P is

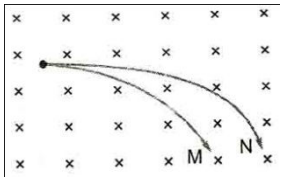


a) $\frac{\sqrt{2}\mu_0 i}{\pi l}$ b) $\frac{\mu_0 i}{4\pi l}$ c) $\frac{\sqrt{2}\mu_0 i}{8\pi l}$ d) $\frac{\mu_0 i}{2\sqrt{2}\pi l}$

2. A wire of length L is bent in the form of a circular coil and current i is passed through it. If this coil is placed in a magnetic field then the torque acting on the coil will be maximum when the number of turns is

a) As large as possible b) Any number c) 2 d) 1

3. Two charged particles M and N enter a space of uniform magnetic field, with velocities perpendicular to the magnetic field. The paths are as shown in figure. The possible reason (s) is/are?



a) The charge of M is greater than that of N b) The momentum of M is greater than that of N

c) Specific charge of M is greater than that of N d) The speed of M is greater than that of N

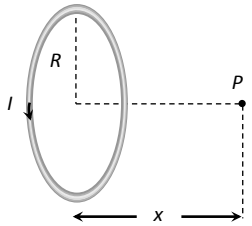
4. Current i_0 is passed through a solenoid of length l having number of turns N when it is connected to a DC source. A charged particle with charge q is projected along the axis of the solenoid with a speed v_0. The velocity of the particle in the solenoid

a) Increases b) Decreases c) Remain same d) Becomes zero

5. A small coil of N turns has an effective area A and carries a current I. It is suspended in a horizontal magnetic field $\vec{B}$ such that its plane is perpendicular to $\vec{B}$. The work done in rotating it by 180° about the vertical axis is

a) $NAIB$ b) $2NAIB$ c) $2\pi NAIB$ d) $4\pi NAIB$

6. A coil having N turns carry a current I as shown in the figure. The magnetic field intensity at point P is

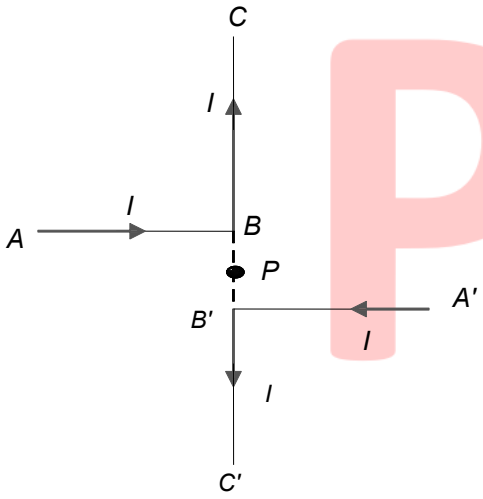


a) $\frac{\mu_0 NIR^2}{2(R^2+x^2)^{3/2}}$ b) $\frac{\mu_0 NI}{2R}$ c) $\frac{\mu_0 NIR^2}{(R+x)^2}$ d) Zero

7. A charged particle (charge q) is moving in a circle of radius R with uniform speed v. The associated magnetic moment μ is given by

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

8. Current through ABC and $A'B'C'$ is I. What is the magnetic field at P? $BP = PB' = r$ (Here $C'B'PBC$ are collinear)



a) $B = \frac{1}{4\pi}\frac{2I}{r}$ b) $B = \frac{\mu_0}{4\pi}\left(\frac{2I}{r}\right)$ c) $B = \frac{\mu_0}{4\pi}\left(\frac{I}{r}\right)$ d) Zero

9. Two circular coils mounted parallel to each other on the same axis carry steady currents. If an observer between the coils reports that one coil is carrying a clockwise current i_1, while the other is carrying a counter clockwise current i_2, between the two coils, then there is

a) A steady repulsive force b) Zero force
c) A repulsive force d) A steady attractive force

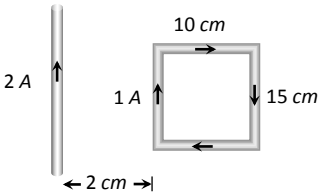
10. The magnetic field due to a current carrying circular loop of radius 3 cm at a point on the axis at a distance of 4 cm from the centre is 54 μT. What will be its value at the centre of the loop?

a) 250 μ T b) 150 μ T c) 125 μ T d) 75 μ T

11. One $Tesla$ is equal to

a) $10^7 gauss$ b) $10^{-4} gauss$ c) $10^4 gauss$ d) $10^{-8} gauss$

12. What is the net force on the square coil



a) $25 \times 10^{-7} N$ moving towards wire
b) $25 \times 10^{-7} N$ moving away from wire
c) $35 \times 10^{-7} N$ moving towards wire
d) $35 \times 10^{-7} N$ moving away from wire

13. If two parallel wires carry current in opposite directions
a) The wires attract each other
b) The wires repel each other
c) The wires experience neither attraction nor repulsion
d) The forces of attraction or repulsion do not depend on current direction

14. The magnetic induction at a point P which is at a distance 4 cm from a long current carrying wire is $10^{-8} tesla$. The field of induction at a distance 12 cm from the same current would be
a) $3.33 \times 10^{-9} tesla$ b) $1.11 \times 10^{-4} tesla$ c) $3 \times 10^{-3} tesla$ d) $9 \times 10^{-2} tesla$

15. A steady electric current is flowing through a cylindrical conductor
a) The magnetic field in the vicinity of the conductor is zero
b) The electric field in the vicinity of the conductor is non-zero
c) The magnetic field at the axis of the conductor is zero
d) The electric field at the axis of the conductor is zero

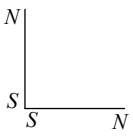
16. The forces existing between two parallel current carrying conductors is F. If the current in each conductor is doubled, then the value of force will be
a) $2F$ b) $4\ F$ c) $5\ F$ d) $F/2$

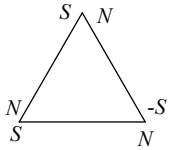
17. A charge $+ Q$ is moving upwards vertically. It enters a magnetic field directed to north. The force on the charge will be towards
a) North b) South c) East d) West

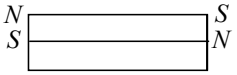
18. The magnetic force acting on a charge particle of charge $-2\mu c$ in a magnetic field of $2T$ actin in y direction, when the particle velocity is $(2i + 3j) \times 10^6 ms^{-1}$ is
a) 8 N in $-z$ direction b) 8 N in z direction c) 8 N in y direction d) 8 N in z direction

19. An electric current is passed through a circuit containing two wires of the same material, connected in parallel. If the lengths and radii of the wires are in the ratio of 4/3 and 2/3, then the ratio of the currents passing through the wire will be
a) 3 b) 1/3 c) 8/9 d) 2

20. In which orientation the resultant magnetic moment of two magnets, will be zero, if magnetic moment of each magnets is M in the following figures?

a) 

b) 

c) 

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