

Chapter :- **MOVING CHARGES AND MAGNETISM**

Assignment 2

 Class 12

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|  **Class : XIIth Subject : PHYSICS** **Date : DPP No. : 2** |

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| **Topic :-** **MOVING CHARGES AND MAGNETISM**  |

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| 1. | An electron is travelling along the $x$-direction. It encounters a magnetic field in the $y$-direction. Its subsequent motion will be |
|  | a) | Straight line along the $x$-direction | b) | A circle in the $xz$-plane |
|  | c) | A circle in the $yz$-plane | d) | A circle in the $xy$-plane |
| 2. | A thin disc having radius $r and charge q$ distributed uniformly over the disc is rotated $n$ rotations per second about its axis. The magnetic field at the centre of the disc is |
|  | a) | $$\frac{μ\_{0} qn}{2r}$$ | b) | $$\frac{μ\_{0} qn}{r}$$ | c) | $$\frac{μ\_{0} qn}{4r}$$ | d) | $$\frac{3μ\_{0} qn}{4r}$$ |
| 3. | The figure shows the cross-section of a long cylindrical conductor of radius $a$ carrying a uniformly distributed current $i.$ The magnetic field due to current at $P$ is |
|  | a) | $$μ\_{0}ir/(2πa^{2}) $$ | b) | $$μ\_{0}ir^{2}/(2πa)$$ | c) | $$μ\_{0}ia/(2πr^{2})$$ | d) | $$μ\_{0}ia^{2}/(πr^{2})$$ |
|  |  |  |  |  |  |  |  |  |
| 4. | Force acting on a magnetic pole of $7.5×10^{-2}$ A-m is 1.5 N. Magnetic field at the point is |
|  | a) | 20 $Wbm^{-2}$ | b) | 50 $Wbm^{-2}$ | c) | 112.5 T | d) | 2.0 T |
| 5. | The direction of magnetic lines of forces close to a straight conductor carrying current will be |
|  | a) | Along the length of the conductor | b) | Radially outward |
|  | c) | Circular in a plane perpendicular to the conductor | d) | Helical |
| 6. | If a proton, deuteron and $α$-particle on being accelerated by the same potential difference enters perpendicular to the magnetic field, then the ratio of their kinetic energies is |
|  | a) | $$1 :2 :2$$ | b) | $$2 :2 :1$$ | c) | $$1 :2 :1$$ | d) | $$1 :1 :2$$ |
| 7. | The strength of the magnetic field at a point $r$ near a long straight current carrying wire is $B$. The field at a distance $\frac{r}{2}$ will be |
|  | a) | $$\frac{B}{2}$$ | b) | $$\frac{B}{4}$$ | c) | $$2B$$ | d) | $$4B$$ |
|  |  |  |  |  |  |  |  |  |
| 8. | A charge particle of mass $m$ and charge $q$ enters a region of uniform magnetic field **B** perpendicular of its velocity **v**. The particle initially at rest was accelerated by a potential difference $V$ (volts) before it entered the region of magnetic field. What is the diameter of the circular path followed by the charged particle in the region of magnetic field? |
|  | a) | $$\frac{2}{B}\sqrt{\frac{mV}{q}}$$ | b) | $$\frac{2}{B}\sqrt{\frac{2mV}{q}}$$ | c) | $$B\sqrt{\frac{2mV}{q}}$$ | d) | $$\frac{B}{q}\sqrt{\frac{2mV}{B}}$$ |
|  |  |  |  |  |  |  |  |  |
| 9. | Positively charged particles are projected into a magnetic field. If the direction of the magnetic field is along the direction of motion of the charge particles, the particles get  |
|  | a) | Accelerated | b) | Decelerated |
|  | c) | Deflected | d) | No changed in velocity |
|  |  |  |  |  |
| 10. | Toroid is |
|  | a) | Ring shaped closed solenoid  | b) | Rectangular shaped solenoid  |
|  | c) | Ring shaped open solenoid | d) | Square shaped solenoid |
|  |  |  |  |  |
| 11. | A long solenoid has 800 turns per metre length of solenoid. A current of 1.6 A flows through it. The magnetic induction at the end of the solenoid on its axis is |
|  | a) | $16×10^{-4}$ T | b) | $8×10^{-4}$ T | c) | $32×10^{-4}$ T | d) | $4×10^{-4}$ T |
| 12. | $PQ$ and $RS$ are long parallel conductors separated by certain distance. $M$ is the mid-point between them (see the figure). The net magnetic field at $M$ is $B$. Now, the current 2 A is switched off. The field at $M$ now becomes*M*2 A*Q**S* |
|  | a) | $$2B$$ | b) | $$B$$ | c) | $$\frac{B}{2}$$ | d) | $$3B$$ |
| 13. | A wire shown in figure carries a current of 40 A. If $r=3.14 cm$, the magnetic field at point $P$ will be |
|  | a) | $$1.6×10^{-3} T$$ | b) | $$3.2×10^{-2} T$$ | c) | $$4.8×10^{-3} T$$ | d) | $$6.0×10^{-4} T$$ |
|  |  |  |  |  |  |  |  |  |
| 14. | Two long parallel wires $P$ and $Q$ are both perpendicular to the plane of the paper with distance $5 m$ between them. If $P$ and $Q$ carry current of $2.5 amp$ and $5 amp$ respectively in the same direction, then the magnetic field at a point half way between the wires is |
|  | a) | $$\frac{\sqrt{3}μ\_{0}}{2π}$$ | b) | $$\frac{μ\_{0}}{π}$$ | c) | $$\frac{3μ\_{0}}{2π}$$ | d) | $$\frac{μ\_{0}}{2π}$$ |
| 15. | The magnetic force on a charged particle moving in the field does not work, because |
|  | a) | Kinetic energy of the charged particle does not change |
|  | b) | The charge of the particle remains same |
|  | c) | The magnetic force is parallel to velocity of the particle |
|  | d) | The magnetic force is parallel to magnetic field |
| 16. | An infinitely long straight conductor $AB$ is fixed and a current is passed through it. Another movable straight wire $CD$ of finite length and carrying current is held perpendicular to it and released. Neglect weight of the wire*A**B**i*1*C**D**i*2 |
|  | a) | The rod $CD$ will move upwards parallel to itself |
|  | b) | The rod $CD$ will move downward parallel to itself |
|  | c) | The rod $CD$ will move upward and turn clockwise at the same time |
|  | d) | The rod $CD$ will move upward and turn anti-clockwise at the same time |
|  |  |  |
| 17. | A wire of length 2 m carrying a current of 1 A is bent to form a circle, the magnetic moment of the coil is  |
|  | a) | $$2π Am^{2}$$ | b) | $$\frac{1}{π} Am^{2}$$ | c) | $$π Am^{2}$$ | d) | $$\frac{2}{π} Am^{2}$$ |
| 18. | A current flows in a conductor from east to west. The direction of the magnetic field at a point above the conductor is |
|  | a) | Towards east | b) | Towards west | c) | Towards north | d) | Towards south |
|  |  |  |  |  |  |  |  |  |
| 19. | A particle having a mass of $10^{-2} kg$ carries a charge of $5×10^{-8}C$. The particle is given an initial horizontal velocity of $10^{5} ms^{-1}$ in the presence of electric field $\vec{E}$ and magnetic field $\vec{B}$. To keep the particle moving in a horizontal direction, it is necessary that(1) $\vec{B}$ should be perpendicular to the direction of velocity and $\vec{E}$ should be along the direction of velocity(2) Both $\vec{B}$ and $\vec{E}$ should be along the direction of velocity(3) Both $\vec{B}$ and $\vec{E}$ are mutually perpendicular and perpendicular to the direction of velocity(4) $\vec{B}$ should be along the direction of velocity and $\vec{E}$ should be perpendicular to the direction of velocityWhich of the following pairs of statements is possible |
|  | a) | (1) and (3) | b) | (3) and (4) | c) | (2) and (3) | d) | (2) and (4) |
|  |  |  |  |  |  |  |  |  |
| 20. | Current $I$ is flowing in conductor shaped as shown in the figure. The radius of the curved part is $r$ and the length of straight portion is very large. The value of the magnetic field at the centre $O$ will be |
|  | a) | $$\frac{μ\_{0}I}{4πr}\left(\frac{3π}{2}+1\right)$$ | b) | $$\frac{μ\_{0}I}{4πr}\left(\frac{3π}{2}-1\right)$$ | c) | $$\frac{μ\_{0}I}{4πr}\left(\frac{π}{2}+1\right)$$ | d) | $$\frac{μ\_{0}I}{4πr}\left(\frac{π}{2}-1\right)$$ |