

Chapter :- **MOVING CHARGES AND MAGNETISM**

Assignment 1

 Class 12

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|  **Class : XIIth Subject : PHYSICS** **Date : DPP No. : 1** |

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

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| 1. | Four charged particles are projected perpendicularly into the magnetic field with equal. Which will have minimum frequency? |
|  | a) | Proton | b) | Electron | c) | $$Li^{+}$$ | d) | $$He^{+}$$ |
|  |  |  |  |  |  |  |  |  |
| 2. | A circular coil carrying a certain current produces a magnetic field $B\_{0}$ at its centre. The coil is now rewound so as to have 3 turns and the same current is passed through it. The new magnetic field at the centre is |
|  | a) | $$\frac{B\_{0}}{9}$$ | b) | $$9B\_{0}$$ | c) | $$\frac{B\_{0}}{3}$$ | d) | $$3B\_{0}$$ |
|  |  |  |  |  |  |  |  |  |
| 3. | A proton of energy $200 MeV$ enters the magnetic field of $5 T$. If direction of field is from south to north and motion is upward, the force acting on it will be |
|  | a) | Zero | b) | $$1.6×10^{-10}N$$ | c) | $$3.2×10^{-8}N$$ | d) | $$1.6×10^{-6}N$$ |
|  |  |  |  |  |  |  |  |  |
| 4. | Magnetic fields at two points on the axis of a circular coil at a distance of $0.05 m$ and 0.2$m$ from the centre are in the ratio 8:1. The radius of the coil is |
|  | a) | 1.0 $m$ | b) | 0.1 $m$ | c) | 0.15 $m$ | d) | 0.2 $m$ |
|  |  |  |  |  |  |  |  |  |
| 5. | A circular coil of 20 turns and radius 10 cm is placed in uniform magnetic field of 0.10 T normal to the plane of the coil. If the current in coil is 5 A, then the torque acting on the coil will be |
|  | a) | 31.4 Nm |
|  | b) | 3.14 Nm |
|  | c) | 0.314 Nm |
|  | d) | zero |
| 6. | A vertical circular coil of radius 0.1 m and having 10 turns carries a steady current. When the plane of the coil is normal to the magnetic meridian, a neutral point is observed at the centre of the coil. If $B\_{H}=0.314×10^{-4}$ the current in the coil is |
|  | a) | 0.5 A | b) | 0.25 A | c) | 2 A | d) | 1 A |
| 7. | A current $i$ flows in a circular coil of radius $r$. If the coil is placed in a uniform magnetic field $B$ with its plane parallel to the field, magnitude of the torque that acts on the coil is |
|  | a) | Zero | b) | $$2πriB$$ | c) | $$πr^{2}iB$$ | d) | $$2πr^{2}iB$$ |
|  |  |  |  |  |  |  |  |  |
| 8. | Two identical bar magnets are fixed with their centres at a distance d apart. A stationary charge $Q$ is placed at $P$ in between the gap of the two magnets at a distance $D$ from the centre $O$ as shown in the figureThe force on the charge $Q$ is |
|  | a) | Zero | b) | Directed along $OP$ |
|  | c) | Directed along $PO$ | d) | Directed perpendicular to the plane of paper |
| 9. | The proton is energy 1 MeV describes a circular path in plane at right angles to a uniform magnetic field of $6.28×10^{-4} T.$ The mass of the proton is $1.7×10^{-27} kg.$ The cyclotron frequency of the proton is very nearly equal to |
|  | a) | $$10^{7} Hz$$ | b) | $$10^{5}Hz$$ | c) | $$10^{6} Hz$$ | d) | $$10^{4} Hz$$ |
| 10. | A particle of mass *m* and charge *q* is placed at a rest in a uniform electric field $E$ and then released. The kinetic energy attained by the particle after moving a distance y is  |
|  | a) | $$q Ey^{2}$$ | b) | $$q E^{2}y$$ | c) | $$q Ey$$ | d) | $$q^{2}Ey$$ |
| 11. | Two particles of equal charges after being accelerated through the same potential difference enter a uniform transverse magnetic field and describe circular path of radii $R\_{1} and R\_{2}$ respectively. Then the ratio of their masses $(M\_{1}/M\_{2})$ is |
|  | a) | $$\frac{R\_{1}}{R\_{2}}$$ | b) | $$\left(\frac{R\_{1}}{R\_{2}}\right)^{2}$$ | c) | $$\frac{R\_{2}}{R\_{1}}$$ | d) | $$\left(\frac{R\_{2}}{R\_{1}}\right)^{2}$$ |
| 12. | A $2 μC$ charge moving around a circle with a frequency of $6.25×10^{12}Hz$ produces a magnetic field 6.28 tesla at the centre of the circle. The radius of the circle is |
|  | a) | 2.25 $m$ | b) | 0.25 $m$ | c) | 13.0 $m$ | d) | 1.25 $m$ |
| 13. | Two particles $X and Y$ having equal charges, after being accelerated through the same potential difference, enter a region of uniform magnetic field and describes circular path of radius $R\_{1} and R\_{2}$ respectively. The ratio of mass of $X to that of Y is$ |
|  | a) | $$\left(R\_{1}/R\_{2}\right)^{1/2}$$ | b) | $$R\_{2}/R\_{1}$$ | c) | $$\left(R\_{1}/R\_{2}\right)^{2}$$ | d) | $$R\_{1}/R\_{2}$$ |
| 14. | The deflection in a moving coil galvanometer is  |
|  | a) | Directly proportional to the torsional constant | b) | Directly proportional to the number of turns in the coil |
|  | c) | Inversely proportional to the area of the coil | d) | Inversely proportional to the current flowing |
| 15. | A microammeter has a resistance of 100 $Ω$ and full scale range of $50μ$ A. It can be used as a voltmeter of as a higher range ammeter provided a resistance is added to it. Pick the correct range and resistance combinations |
|  | a) | 50 V range with 10 k $Ω$ resistance in series | b) | 10 V range with 200 k $Ω$ resistance in series |
|  | c) | 10 mA range with 1 $Ω$ resistance in parallel | d) | 10 mA range with 0.1 $Ω$ resistance in parallel |
| 16. | A straight section $PQ $ of a circuit lies along the *X*-axis from $x=\frac{-a}{2} to x=\frac{a}{2}$ and carries a steady current $i.$ The magnetic field due to the section $PQ$ at a distance $x=+a$ will be |
|  | a) | Proportional to $a$ | b) | Proportional to 1/ $a$ | c) | Proportional to $a^{2}$ | d) | Zero |
|  |  |  |  |  |  |  |  |  |
| 17. | A vertical wire carrying a current in the upward direction is placed in horizontal magnetic field directed towards north. The wire will experience a force directed towards |
|  | a) | North | b) | South | c) | East | d) | West |
| 18. | A direct current $I$ flows along the length of an infinitely long straight thin walled pipe, then the magnetic field is |
|  | a) | Uniform throughout the pipe but not zero |
|  | b) | Zero only along the axis of the pipe |
|  | c) | Zero at any point inside the pipe  |
|  | d) | Maximum at the centre and minimum at the edge |
| 19. | A current of $1 ampere$ is passed through a straight wire of length $2.0 metres$. The magnetic field at a point in air at a distance of $3 metres$ from either end of wire and lying on the axis of wire will be |
|  | a) | $$\frac{μ\_{0}}{2π}$$ | b) | $$\frac{μ\_{0}}{4π}$$ | c) | $$\frac{μ\_{0}}{8π}$$ | d) | Zero |
| 20. | When a positively charged particle enters a uniform magnetic field with uniform velocity, its trajectory can be(1) a straight line(2) a circle(3) a helix |
|  | a) | (1) only | b) | (1) or (2) |
|  | c) | (1) or (3) | d) | Any one of (1), (2) and (3) |