CHAPTER-4
MOVING CHARGES AND MAGNETISM

1. A charge q is moving in a magnetic field then the magnetic force does not depend upon
(A)Charge (B)Mass
(C)Velocity (D)Magnetic field

2. If a charge q is going in the direction of magnetic field $\vec{B}$ with the velocity of $\vec{v}$ then the force on electron is
(A)Zero (B)$q(\vec{v}.\vec{B})$
(C)$q(\vec{v} \times \vec{B})$ (D)None of these

3. When a charged particle enters perpendicular to the external uniform magnetic field, it follows
(A)Linear path (B) helical path
(C) circular path (D) elliptical path

4. The magnetic force on neutral particle moving in external uniform magnetic field is
(A)Zero (B)qvB
(C)$qvB\ sin\theta$(D)qE

5. The correct expression for Lorentz force is
(A)$q[\vec{E} + (\vec{B} \times \vec{V})](B)q[\vec{E} + (\vec{V} \times \vec{B})]$
(C)$q(\vec{V} \times \vec{B})$(D) $q\vec{E}$

6. When the charged particle move in combined electric and magnetic field, the force acting on it is
(A)centripetal force (B) centrifugal force
(C)Lorentz force (D) magnetic force

7. A charged particle enters a uniform magnetic field perpendicular to it.T he magnetic field
(A)Increases the speed of the particle
(B)Decreases the kinetic energy of the particle
(C)Changes the direction of motion of the particle
(D)Both(A)&(C)

8. If the direction of the initial velocity of the charged particle is neither along nor perpendicular to that of the magnetic field, then the orbit will be
(A)a straight line (B)an ellipse
(C) a circle (D) a helix

9. A magnetic field can be produced by
(A) a moving charge (B) a static charge
(C) neutral particle (D) All of these

10. A charged particle moving in a magnetic field increases its velocity, then its radius of the circle
(A)Decreases (B)Increases
(C)Remains the same(D)Becomes half

11. A proton (or charged particle) moving with velocity v is acted upon by electric field E and magnetic field *(B)* The proton will move undeflected if
(A)E is perpendicular to B
(B)E is parallel to v and perpendicular to B
(C) E and B both are parallel to v
(D)E, B and v are mutually perpendicular and $v = \frac{E}{B}$

12. Magnetic field at the center of circular current loop is
(A)$\frac{\mu_0 I}{2R}$ (B)$\frac{\mu_0 \pi I}{2R}$

(C)$\frac{I}{2R}$ (D)$\frac{\mu_0 I}{2\pi R}$

13. SI unit of magnetic field is
(A)dyne (B)ohm
(C)tesla (D)volt

14. Cyclotron is a device used to
(A)slow down charged particles
(B)accelerate positively charged particle
(C) accelerate negatively charged particle
(D) accelerate neutral particle

15. In a cyclotron, the angular frequency of a charged particle is independent of
(A)Mass (B)Speed
(C)Charge (D)Magnetic field

16. An electron having mass m, charge q and kinetic energy E enters a uniform magnetic field B perpendicularly. Then its frequency of rotation will be
(A)$\frac{qB}{\pi m}$ (B)$\frac{qB}{2\pi m}$
(C)$\frac{qBE}{2\pi m}$ (D)$\frac{qB}{\pi mE}$

17. Unit of magnetic permeability is
(A)*A/metre* (B)*A*/metre^2
(C) h*enry* (D) h*enry/metre*

18. The magnetic force on a current carrying conductor of length l in an external magnetic field $\vec{B}$ is given by
(A)$\frac{\vec{l}\times\vec{B}}{I}$ (B) $\frac{I\times\vec{B}}{\vec{l}}$
(C)$I(\vec{l}\times\vec{B})$ (D)$I^2\vec{l}\times\vec{B}$

19. Vector form of Biot-Savart's law is
(A)$\overrightarrow{dB} = \frac{\mu_0}{4\pi} i \left(\frac{\overrightarrow{dl}\times\vec{r}}{r}\right)$ (B)$\overrightarrow{dB} = \frac{\mu_0}{4\pi} i^2 \left(\frac{\overrightarrow{dl}\times\vec{r}}{r}\right)$
(C)$\overrightarrow{dB} = \frac{\mu_0}{4\pi} i^2 \left(\frac{\overrightarrow{dl}\times\vec{r}}{r^2}\right)$ (D)$\overrightarrow{dB} = \frac{\mu_0}{4\pi} i \left(\frac{\overrightarrow{dl}\times\vec{r}}{r^3}\right)$

20. The magnetic induction at the centre of a current carrying circular of coil radius *r*, is
(A)Directly proportional to *r* (B)Inversely proportional *r*
(C)Directly proportional to *r*^{2} (D)Inversely proportional to *r*^{2}

21. Ampere's circuital law is given by
(A)$\oint \vec{H}\cdot\overrightarrow{dl} = \mu_0 I_{net}(B)\oint \vec{B}\cdot\overrightarrow{dl} = \mu_0 I_{net}$
(C)$\oint \vec{B}\cdot\overrightarrow{dl} = \mu_0 J$ (D) $\oint \vec{H}\cdot\overrightarrow{dl} = \mu_0 J$

22. The magnetic induction at any point due to a long straight wire carrying a current is
(A)Proportional to the distance from the wire
(B)Inversely proportional to the distance from wire
(C)Inversely proportional to the square of the distance from the wire
(D)Does not depend on distance

23. The magnetic field *B* with in the solenoid having *n* turns per metre length and carrying a current of *I ampere* is given by
(A)$\mu_0 nI$ (B)$\mu_0 I$

(C)$\mu_0 RI$(D)μ_0/nI

24. A toroid has number of turns per unit length *n*, current *I*, then the magnetic field is

(A)$\mu_0 nI$ (B)$\mu_0 I$

(C)$\mu_0 RI$ (D)μ_0/nI

25. Which of the following statement is correct?

A) The magnetic field in the open space inside the toroid is constant

B) The magnetic field in the open space exterior to the toroid is constant

C) The magnetic field inside the core of a toroid is constant

D) The magnetic field inside the core of a toroid is zero

26. Two long parallel wires carrying currents in opposite direction

(A)Attract each other (B)Repel each other

(C)Neither attract nor repel (D)Get rotated to be perpendicular to each other

27. If *m* is magnetic moment and *B* is the magnetic field, then the torque is given by

(A)$\vec{m} \cdot \vec{B}$ (B)$\frac{\vec{m}}{\vec{B}}$

(C)$\vec{m} \times \vec{B}$ (D)$|\vec{m}| \cdot |\vec{B}|$

28. A current carrying loop is placed in a uniform magnetic fiel(D) The torque acting on it does not depend upon

(A)Shape of the loop (B)Area of the loop

(C)Value of the current (D)Magnetic field

29. An electron moves with a constant speed *v* along a circle of radius *r*. Its magnetic moment will be (*e* is the electron's charge)

(A)evr (B)$\frac{1}{2}evr$

(C)$\pi r^2 ev$ (D)πevr

30. In a moving coil galvanometer, the deflection of the coil θ is related to the electrical current *i* by the relation

(A)$i \propto tan\theta$ (B)$i \propto \theta$

(C)$i \propto \theta^2$ (D) $i \propto \sqrt{\theta}$

31. The sensitiveness of a moving coil galvanometer can be increased by decreasing

(A) The number of turns in the coil

(B)The area of the coil

(C) The magnetic field

(D)The couple per unit twist of the suspension

32. To convert a galvanometer into a voltmeter one should connect a

(A) High resistance in series with galvanometer

(B) Low resistance in series with galvanometer

(C) High resistance in parallel with galvanometer

(D) Low resistance in parallel with galvanometer

33. To convert a galvanometer into an ammeter one should connect a

(A) High resistance in series with galvanometer

(B)Low resistance in series with galvanometer

(C)High resistance in parallel with galvanometer

(D)Low resistance in parallel with galvanometer

ANSWER KEYS:

Question	Option	Question	Option	Question	Option	Question	Option
1	**B**	11	**D**	21	**B**	31	**D**
2	**A**	12	**A**	22	**B**	32	**A**
3	**C**	13	**C**	23	**A**	33	**D**
4	**A**	14	**B**	24	**A**		
5	**B**	15	**B**	25	**C**		
6	**C**	16	**B**	26	**B**		
7	**C**	17	**D**	27	**C**		
8	**D**	18	**C**	28	**A**		
9	**A**	19	**D**	29	**B**		
10	**B**	20	**B**	30	**B**		