Moving Charges in Magnetic and Electric Fields | Saitechinfo NEET JEE Academy Worksheet

1. A charged particle is moving perpendicular to a uniform magnetic field. The nature of the path of the charged particle is:
    - a) Circular
    - b) Parabolic
    - c) Straight line
    - d) Elliptical
2. A proton moves in a uniform electric field. Its acceleration:
    - a) Remains constant
    - b) Increases
    - c) Decreases
    - d) Becomes zero
3. The force experienced by a charged particle moving parallel to a uniform magnetic field is:
    - a) Maximum
    - b) Minimum
    - c) Zero
    - d) Infinity
4. A charged particle enters a uniform magnetic field with its velocity at an angle to the field. The particle will move in a:
    - a) Circular path
    - b) Straight path
    - c) Helical path
    - d) Parabolic path
5. A positively charged particle enters a uniform magnetic field perpendicularly. The direction of the force on the particle is given by:
    - a) Right-hand thumb rule
    - b) Left-hand rule
    - c) Fleming's left-hand rule
    - d) Fleming's right-hand rule
6. An electron moves in a magnetic field and experiences a force. The magnetic field must be:
    - a) In the direction of motion
    - b) Opposite to the direction of motion
    - c) Perpendicular to the direction of motion
    - d) None of the above
7. A particle of charge q and mass m moving with velocity v enters a uniform magnetic field B at an angle θ to the field. The radius of its circular path is:
    - a) $\frac{mv}{qB}$
    - b) $\frac{mv \sin \theta}{qB}$
    - c) $\frac{mv \cos \theta}{qB}$
    - d) $\frac{qB}{mv}$
8. A charged particle enters a magnetic field and moves in a helical path. The pitch of the helix depends on:

- a) Charge of the particle
- b) Mass of the particle
- c) Velocity component parallel to the field
- d) Velocity component perpendicular to the field

9. The force on a charged particle in a magnetic field is maximum when:
   - a) The particle is stationary
   - b) The particle is moving parallel to the field
   - c) The particle is moving perpendicular to the field
   - d) The particle is moving at an angle of 45° to the field
10. A charged particle is moving in a circular path under the influence of a uniform magnetic field. The time period of the particle depends on:
    - a) Radius of the path
    - b) Velocity of the particle
    - c) Magnetic field
    - d) Both b and c
11. The magnetic force on a moving charged particle is independent of:
    - a) The charge of the particle
    - b) The speed of the particle
    - c) The magnetic field
    - d) The velocity of the particle
12. The path of a charged particle in a magnetic field is a circle if:
    - a) The particle moves parallel to the field
    - b) The particle moves perpendicular to the field
    - c) The particle is at rest
    - d) The particle moves at an angle to the field
13. A proton and an electron move in the same direction in a magnetic field. They experience:
    - a) Forces of equal magnitude and direction
    - b) Forces of equal magnitude and opposite direction
    - c) Forces of different magnitude and same direction
    - d) Forces of different magnitude and opposite direction
14. In a velocity selector, the electric field and magnetic field are perpendicular to each other. For a charged particle to pass through without deflection, its velocity must be:
    - a) $E \times B$
    - b) E/B
    - c) B/E
    - d) $B \times E$
15. The work done by the magnetic force on a charged particle moving in a magnetic field is:
    - a) Maximum
    - b) Minimum
    - c) Zero
    - d) Infinite

7. b
8. c
9. c
10. c
11. d
12. b
13. b
14. b
15. c

Answer Key:
1. a
2. a
3. c
4. c
5. c
6. c