Magnetic Effect of Current

A. Choose the correct answer:

1. What is the principle behind the working of an electric motor?

- A) Magnetic effect of current
- B) Heating effect of current
- C) Chemical effect of current
- D) Gravitational force

2. What happens when a current-carrying conductor is placed in a magnetic field?

- A) It experiences a force
- B) It starts rotating on its own
- C) It loses its conductivity
- D) It generates heat

3. The right-hand thumb rule is used to determine the:

- A) Direction of current in a conductor
- B) Direction of magnetic field around a current-carrying conductor
- C) Strength of the magnetic field
- D) Force acting on a moving charge

B. Fill in the Blanks:

- The region around a current-carrying conductor where its influence can be felt is called the ______.
- The direction of the force on a current-carrying conductor in a magnetic field is determined by ______ rule.
- 3. A solenoid behaves like a ______ when an electric current is passed through it.

C. Case Study:

A scientist, Dr. Mehta, conducted an experiment to study the effect of electric current on a magnetic compass. He set up a circuit with a straight wire carrying current and placed a magnetic compass near it. When the current was switched on, the compass needle deflected. When the direction of the current was reversed, the deflection also changed. Dr. Mehta then replaced the straight wire with a coil and observed that the magnetic effect became stronger.

Questions & Answers:

- 1. What was the main observation in Dr. Mehta's experiment?
- 2. Why did the compass needle deflect when current was passed through the wire?
- 3. What effect did replacing the straight wire with a coil have on the experiment?
- 4. How does this experiment demonstrate the magnetic effect of current?

D. Short Answer Questions:

- 1. What is the magnetic field around a current-carrying conductor?
- 2. How does a solenoid create a magnetic field similar to a bar magnet?
- 3. What is the role of an electromagnet in daily life applications?

E. Long Answer Questions:

- 1. Explain the working principle of an electric motor and its applications.
- 2. Discuss the factors that affect the strength of the magnetic field around a straight current-carrying conductor.
- 3. Describe how the magnetic effect of current is used in electromagnets and their real-life uses.