

**CBSE class 10 - Magnetic Effects of Electric Current question and answers Set B**

**Topic – Electromagnet, Fleming’s left-hand rule, Force on a current carrying conductor, D.C. motor.**

**1. What are the properties of an electromagnet ?**

- a. Electromagnet is a temporary magnet that is if electric current stops passing through the solenoid, it will be demagnetized.
- b. The electromagnet's polarity can be reversed by inverting the direction of electric current through the solenoid.
- c. The strength of an electromagnet can be increased or decreased according to our needs.

2. On which factor force on a current carrying conductor placed in a magnetic field depends on

**2. What will happen if we place a current carrying conductor in a magnetic field.**

When a current carrying conductor is placed in a magnetic field of a permanent magnet, the below things happen-

- a. The conductor experiences a force in the magnetic field.
- b. The direction of force is perpendicular to the magnetic field.
- c. The direction of the force depends on the direction of current flowing through the conductor.
- d. We can determine the direction of force by the Fleming left-hand rule.

**3. State and explain Fleming’s left-hand rule.**

Stretch the left-hand fingers so that the thumb, first finger, and central finger are perpendicular. If the first finger points in the direction of the magnetic field and the centre finger points in the current direction, then the thumb finger will indicate the direction of motion of the conductor.

**4. On which factors force acting on a current carrying conductor depends ?**

- a. The force acting on a current carrying conductor is directly proportional to the strength of the magnetic field.
- b. The acting force is directly proportional to the amount of current passing through the conductor.
- c. The acting force is directly proportional to the length of the current carrying conductor.

Combining these three rules, we can write,  $F = BIL\sin\theta$

Here,  $\theta$  is the angle between the current and the magnetic field.

#### **5. When the force on a current carrying conductor will be maximum ?**

Suppose the current carrying conductor is placed perpendicular to the magnetic field. In that case, the angle between the current and the magnetic field is 90-degree, the maximum force will be exerted on the conductor.

$$F = B.I.L\sin 90 = BIL$$

#### **6. When the force on a current carrying conductor will be minimum or zero ?**

Suppose the current carrying conductor is placed parallel to the magnetic field. In that case, the angle between the current and the magnetic field is 0-degree. No force will be exerted on the conductor.

$$F = B.I.L\sin 0 = 0$$

#### **7. What do you mean by magnetic field strength (B) ?**

Magnetic field strength is defined as the force acting part unit current, per unit length of the conductor placed perpendicular to the magnetic field.

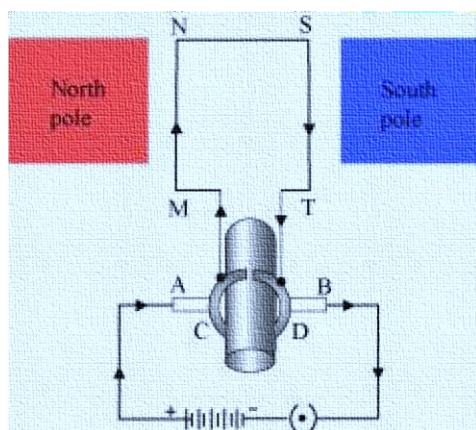
S.I unit of magnetic field strength is Tesla

#### **8. What is the working principle of an electric motor ?**

An electrical motor works on the principle of the magnetic effect of electric current. If a current carrying conductor is placed in a magnetic field, it will experience a force.

#### **9. Draw a labeled diagram of an D.C motor and explain how it works ?**

The internal structure of an D.C electric motor is shown below-



When current is flows through the coil MNST, according to Flemings left-hand rule, a downward force acts on the MN side of the coil and at the same time, an upward force acts on ST side of the coil. This constitutes a couple. As a result, the coil rotates anti-clockwise.

At the midpoint, no current will be flow through the armature coil as there is a split ring. But according to the laws of inertia of motion, it will rotate and again touch the brush.

After half a rotation, the current direction in the coil is reversed due to the split ring and the position of MN and ST interchange. Now, a downward force acts on ST side of coil and at the same time, an upward force acts on MN side of the coil. Hence, the direction of rotation of the coil remains the same.

This is how a coil can rotate continuously in a particular direction.

### 10. Why commutator is used in D.C. motors?

The split ring used in an electric motor is known as a commutator. The commutator reverses the direction of current flowing through the coil after each half rotation of the coil. It helps the coil to rotate continuously in the same direction.

If We dont use a commutator, the direction of current in an arm of the coil will always remain the same. So the direction of the force on the arm will not change, and the coil will not be able to complete one rotation.

**More questions for your board preparation-**

[CBSE Class 10 – Electricity important question and answers Part A](#)

[CBSE Class 10 – Electricity important question and answers Part B](#)

[CBSE Class 10 – Magnetic Effects of Electric Current important question and answers Part A](#)

[CBSE Class 10 – Electricity important questions Set A](#)

[CBSE class 10 – Electricity important questions Set B](#)

[CBSE class 10 – Electricity important questions Set C](#)

[CBSE class 10 – Magnetic Effects of Electric Current important questions Set A](#)

[CBSE class 10 – Magnetic Effects of Electric Current important questions Set B](#)

[CBSE class 10 – Magnetic Effects of Electric Current important questions Set C](#)

More questions will be coming soon. For any assistance contact us on –

[cbsephysicsupdate@gmail.com](mailto:cbsephysicsupdate@gmail.com)

Please share this pdf and our website link with your friends to support our work.

Thank You