

# SANJEEVANI PUBLIC SCHOOL, UTTAM NAGAR

## CLASS- X (SCIENCE)

### ASSIGNMENT

#### MAGNETIC EFFECT OF ELECTRIC CURRENT

NAME OF STUDENT: - \_\_\_\_\_

#### Q1. Define magnetic field and magnetic field lines

**Ans. Magnetic Field:** - The space surrounding a magnet, in which magnetic force is exerted, is called a magnetic field.

- The direction of magnetic field at a point is the direction of the resultant force acting on a hypothetical north pole placed at that point.

**Magnetic field lines:** - The magnetic lines of force are the lines drawn in a magnetic field along which a north magnetic pole would move.

#### Q2. Write properties of magnetic field lines

**Ans. Properties of Magnetic Field Lines:** -

- 1) A magnetic field line is directed from north-pole to south-pole outside the magnet.
- 2) A magnetic field line is a closed and continuous curve
- 3) The magnetic field lines are crowded near the pole where the magnetic field is strong and are far apart near the middle of the magnet and far from the magnet where the magnetic field is weak.
- 4) The magnetic field lines never intersect each other because if they do so, there would be two directions of magnetic field at that point which is absurd.

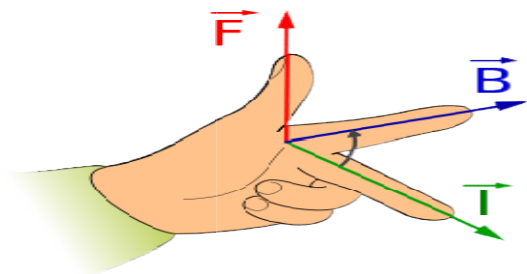
#### Q3. Define (a) Right Hand Thumb rule (b) Fleming left hand rule (c) Fleming Right hand Rule

**Ans. (a) DIRECTION OF MAGNETIC FIELD: RIGHT-HAND THUMB RULE**

According to this rule, imagine the straight conductor in your right hand such that the thumb points in the direction of current. The direction of curling of fingers of the right hand gives the direction of magnetic field lines. This law proposed by Maxwell so it is also known as Maxwell right hand thumb rule.

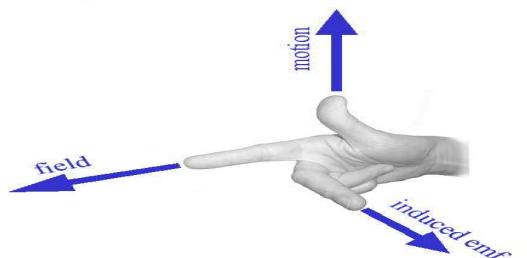
**(b) Fleming Left Hand Rule for the direction of Force:** -

According to Fleming left hand rule, arrange three fingers (thumb, index, middle) of left hand mutually perpendicular to each other, adjust your hand in such way that index finger is in the direction of magnetic field and central finger in the direction of current then in which direction your thumb is pointed it shows the direction of motion of a conductor



**(c) Fleming Right Hand Rule for the direction of Induced Current:** -

According to Fleming Right hand rule, arrange three fingers (thumb, index, central) of right hand mutually perpendicular to each other adjust your hand in such a way that your thumb is in the direction of motion and index finger is in direction of magnetic field and the in which direction your central finger is pointed it shows the direction of induced current.



**Q62. What is direct current and alternating current? Write advantages of AC over DC and disadvantages of AC over DC**

**Ans. Direct Current (DC):** - If the current flows always in same direction, it is called direct current.

The current get by cell or battery is a direct current

The polarity of direct current is fixed

**Alternating Current (AC):** - If the current changes direction after equal intervals of time, it is called alternating current.

The current comes in our home is alternating current

The polarity of alternating current is not fixed.

**Frequency of AC:** -The number of cycles completed by the AC in one second is called the frequency of AC. The frequency of AC in India is 50 Hz.

**Advantages of AC over DC:**

1. With the help of a transformer, AC at any desired voltage can be obtained.
2. The power wastage in AC transmission is almost negligible and as such the cost of transmission is low.
3. AC can be controlled by using a choke coil and the loss is very low where as DC can be controlled by using ohmic resistance where energy loss is huge
4. When required AC can be changed into DC
5. AC machines are durable and do not need much maintenance

**Disadvantages of AC over DC:**

1. AC is much danger than DC
2. AC cannot be used for electroplating where as DC can be used.

**Q63. Define short circuiting and overloading**

**Ans. Short Circuiting:** - Touching of the live wire and the neutral wire directly is known as short circuit.

**Overloading:** - If too many electrical appliances of high power rating are switched on at the same time, they draw an extremely large current from the circuit this is known as overloading.

Overloading causes fire in domestic circuit

**Q64. What is fuse?**

**Fuse:** - A fuse is a safety device having a short length of a thin wire made of tin or tin-lead alloy having low melting point, which melts and breaks the circuit if the current exceeds a safe value.

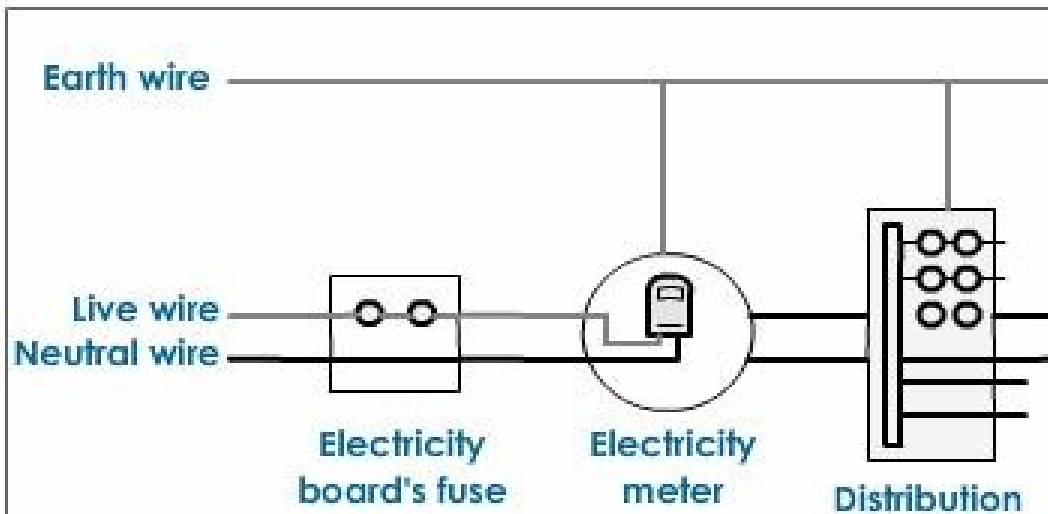
**Q65. Explain Domestic Circuit**

**Ans. House Hold Electric Circuits (Or Domestic Circuit Wiring)**

Usually there are two separate circuits in a house, the lighting circuit with a 5 A fuse and the power circuit with a 15 A fuse.

The red coloured wire is the live wire, the black wire is the neutral wire where as green wire is neutral wire. Each distribution circuit is provided with a separate fuse so that is a fault like short circuiting occurs in one circuit, its corresponding fuse blows off but the other circuit remains unaffected.

In domestic circuit appliances are connected in parallel.



**Q66. Differentiate a bar magnet and an Electromagnet**

**Ans.**

Bar Magnet (Or Permanent Magnet)	Electromagnet
<ol style="list-style-type: none"> <li>1. The bar magnet is permanent magnet</li> <li>2. It produce a weak force of attraction</li> <li>3. The strength of bar magnet cannot be changed</li> <li>4. Polarity cannot be changed</li> </ol>	<ol style="list-style-type: none"> <li>1. An electromagnet is temporary magnet. It behave like magnet when current is passed through it</li> <li>2. It produces very strong magnetic force</li> <li>3. The strength of electromagnet can be changed by changing the number of turns in the coil and by changing the amount of current.</li> <li>4. Polarity can be changed by reversing the direction of current.</li> </ol>

**Q67. What is solenoid? Draw its diagram**

**Ans. Solenoid:** - The solenoid is a long coil containing a large number of close turns of insulated copper wire. The magnetic field produced by current carrying solenoid is similar to the magnetic field produced by a bar magnet.

