

## **Electricity and Magnetism**

**1. What is Magnet?**

Ans. A Magnet is a material that can attract materials made of iron, nickel and cobalt.

**2. Magnets are how many types?**

Ans. Magnets are two types

- a. Natural Magnet: Ex: Lodestone
- b. Artificial Magnet: Ex: Bar Magnet, Horse shoe magnet, disc magnet etc.

**3. What are Magnetic Materials?**

Ans. Materials that are attracted to a magnet are called Magnetic Materials. These materials are made of either iron or Nickel or Cobalt.

**4. What are Non-magnetic Materials?**

Ans. Materials that are not attracted to a magnet are called Non-magnetic Materials.

Materials like wood, plastic, rubber are non-magnetic materials.

**5. Polarity of an electromagnet depends on which factor?**

Ans. Polarity of an electromagnet is depending on the direction of the flow of current.

**6. What are Magnetic Poles?**

Ans. The ends of the magnet where the magnetic force of attraction is more are called the poles of the magnet or Magnetic Poles.

**7. What is Directional Property?**

Ans. Freely suspended magnet always aligns in the north-south direction. This property of magnet is called its Directional Property.

**8. What are Attractive and Repulsive Property of Magnet?**

Ans. The attraction between unlike poles of magnets is called the Attractive Property of magnets and the repulsion between the like poles of magnet is called the Repulsive Property of Magnet.

**9. What is Magnetic Field?**

Ans. The region around a magnet within which a magnetic substance experiences the force of attraction or repulsion is known as its Magnetic Field.

**10. What is Magnetic Flux and Flux Density?**

Ans. The magnetic field lines passing through a closed surface are known as Magnetic Flux and the change on magnetic field lines per unit area is known as Flux Density.

**11. What are the properties of Magnetic Field Lines?**

Ans. The properties of Magnetic Field line are

- Magnetic field lines are continuous, closed curves originating from the north pole and converging at the south pole of a bar magnet.
- Within a bar magnet the field lines move from the south pole to the north pole
- No two field lines intersects each other.

**12. What is Compass?**

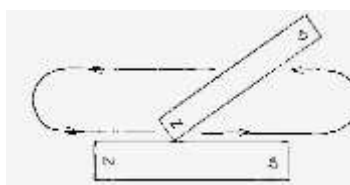
Ans. A compass is a device which is used to find directions. It consists of a magnetic needle pivoted on a sharp pointed support and free to rotate in a horizontal plane. The magnetic needle always points towards the north-south direction. Magnetic compass is mainly used by sailors, sea voyagers and explorers.

**13. What is Magnetization?**

Ans. The process of making a magnet from magnetic material is called Magnetization.

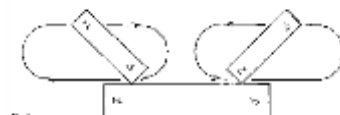
**14. How can we make a magnetic material with single touch method?**

Ans. In a single touch method a magnetic material is taken and placed horizontally on a surface. The north pole or south pole of a magnet is used to touch or stroke the surface of the magnetic material from one end to the other in one direction. The sequence is repeated until the magnetic material starts behaving like a magnet.



**15. How can we make a magnetic material with double touch method?**

Ans. In the double touch method two permanent magnets are used for touching or stroking. The north pole of one magnet and the south pole of the other magnet are placed at the middle of the magnetic material for stroking. The magnet on the left side is used for stroking towards the left and the magnet on the right side is used for stroking towards the right in opposite directions. The sequence of stroking is repeated until the magnetic material starts behaving like a magnet.



**16. What is Permanent Magnet?**

Ans. A magnet which retains its magnetic properties for a long period of time is called Permanent Magnet.

Permanent Magnets can retain their magnetic properties once they are magnetized.

**17. What is Temporary Magnet?**

Ans. A magnet which cannot retain its magnetic properties without a magnetizing field is called Temporary Magnet.

Temporary magnet behaves like a magnet only in the presence of magnetizing field and loses its magnetic properties if the magnetizing field is withdrawn.

**18. What is Electromagnet?**

Ans. Magnetic materials can be converted to magnets by passing electric current through them. A magnet formed through this method is called Electromagnet.

**19. Which type of materials are used as Core of Electromagnets?**

Ans. The material used as the core of the electromagnet must act as a strong magnet when current passes through it and must not retain the magnetic properties when current supply is cut off.

Soft Iron, Cobalt and Nickel are some magnetic materials that exhibit magnetic properties as long as they are placed in a magnetic field.

**20. Why Steel are not used as core of electromagnets?**

Ans. Steel, acts as a permanent magnet once it is magnetized. If the objects made up of steel are used as the core of the electromagnet, they would continue to exhibit magnetic properties even after the electric current is withdrawn. Therefore, steel cannot be used as the core of an electromagnet.

**21. On which factors strength of an electromagnet depends?**

Ans. Strength of an electromagnet depends on

- The number of turns of copper wire around the magnetic materials.
- The magnitude of electric current passed through it. And
- The nature of material on which the coil is wound.

**22. What are the uses of Electromagnet?**

Ans. Electromagnets are used in electric bells, and electric cranes to lift and drop iron and steel in scrapyards.

**23. How can we take care of a magnet?**

Ans. When magnets are kept for a long time leaving the magnetic poles free or exposed, they slowly lose their magnetic properties.

Therefore, magnets have to be preserved to prevent the loss of magnetic properties. Usually, bar magnets are stored as pairs with unlike poles close to each other and separated by a small wooden piece. Two pieces of soft iron called keepers are kept at the two ends of the bar magnet.

A horseshoe magnet is preserved by keeping a single keeper at its two poles.

**24. What is Magnetic Levitation?**

Ans. Magnetic levitation or Magnetic suspension is the method by which an object is lifted or suspended with the help of magnets.

Ex: Maglev trains work on magnetic levitation. These trains run without touching the track. They float above the track with magnetic levitation. They can travel at very high speeds of more than 500 km/hr.

**25. How can we demagnetize any Permanent Magnet?**

Ans. We can demagnetize any permanent magnet by using the following methods.

- Heating
- Hammering
- Passing Electricity

**26. What happen when we heating a Permanent Magnet?**

Ans. If a permanent magnet is heated it loses its magnetic properties gradually. When heated, the molecules of the magnet acquire more energy and hence vibrate faster. This disturbs the alignment of the magnetic molecules and hence a magnet loses its magnetic properties.

Above a particular temperature called Curie temperature, the magnet loses its magnetic properties completely. When the magnet is cooled down, some of its magnetic properties may appear again.

**27. What happen when we hammering on a Permanent Magnet?**

Ans. Repeated hammering of a magnet disturbs the alignment of the magnetic molecules and hence it loses its magnetic properties.

**28. What happen when we pass electricity in a Permanent Magnet?**

Ans. A magnet can be demagnetized by placing it inside the coil which is connected to an alternating current source. The continuous changing magnetic field created by the alternating current disturbs the molecules in the magnet and hence it loses its magnetic properties.

**29. What are the uses of Magnets?**

Ans. The uses of Magnets are

- a. Magnets are used in electronic devices such as compass and refrigerator.
- b. They are used in loudspeaker, radio and microphone.
- c. Electric motors and power generators have strong magnets inside them.
- d. Magnets are used on Magnetic storage devices, such as hard disk, tape recorder.
- e. Magnetic strips are used to store information on credit cards, ATM cards etc. Magnets are used in many medical devices such as MRI scanning machine, CT scanning machine etc.