Class : 9th

Subject : Physics

Chapter : 8 (Magnetism)

New Book Punjab Board

Short Answer Questions

8.1 What are temporary and permanent magnets?

Ans:

Temporary magnets: Temporary magnets are the magnets that work in the presence of a magnetic field of permanent magnets. Once the magnetic field vanishes, they lose their magnetic properties.

Permanent magnets: Permanent magnets retain their magnetic properties for every. These are either found in nature or artificially made by placing objects made of steel and some special alloys in a strong magnetic field for a sufficient time.

8.2 Define magnetic field of a magnet.

Ans: A magnetic field is the region around a magnel where an other magnetic object experience a force on it.

Explanation: When a magnet attracts a certain magnetic material, it exerts some force to do so. Similarly, when it attracts or repels a magnetic pole of another magnet, it exerts a force on it. This force can be observed upto a certain distance from the magnet.

8.3 What are magnetic lines of force?

Ans: Magnetic lines of force are imaginary lines that represent the direction and strength of a magnetic. field; their density indicates field strength, and they form closed loops from north to south pole.

8.4 Name some uses of permanent magnets and electromagnets.

Ans: Use of permanent magnets: Speakers, compasses, electric meters. Use of electromagnets: Electric bells, lifting Cranes, MRI machines.

8.5 What are magnetic domains?

Ans: Magnetic domains are microscopic regions with in a ferromagnetic material where atomic magnetic moments are aligned, creating a localized magnetic field, their alignment determines the overall magnetism of the material.

8.6 Which type of magnetic field is formed by a current-carrying long coil?

Ans: A long coil of wire carrying a current produces a magnetic field that is similar to that of a bar magnet. The field lines are concentrated inside the coil and spread out outside, resembling the field lines of a bar magnet.

8.7 Differentiate between paramagnetic and diamagnetic materials.

Ans: Paramagnetic materials: Paramagnetic materials are weakly attracted to external magnetic fields due to unpaired electrons.

Diamagnetic materials: Diamagnetic materials are weakly repelled due to paired electrons and induced opposing magnetic moments.

Constructed Response Questions.

8.1 Two bar magnets are stored in a wooden box. Label the poles of the magnets and identify P and Q objects.

Ans. To store the magnets safety, we should keep the P object (N-pole) of one magnet near the Q-object (S-pole) of the other magnet.

Reason : This is because opposite poles attract each other and this arrangement will help prevent the magnets from attracting other metal objects for each other.

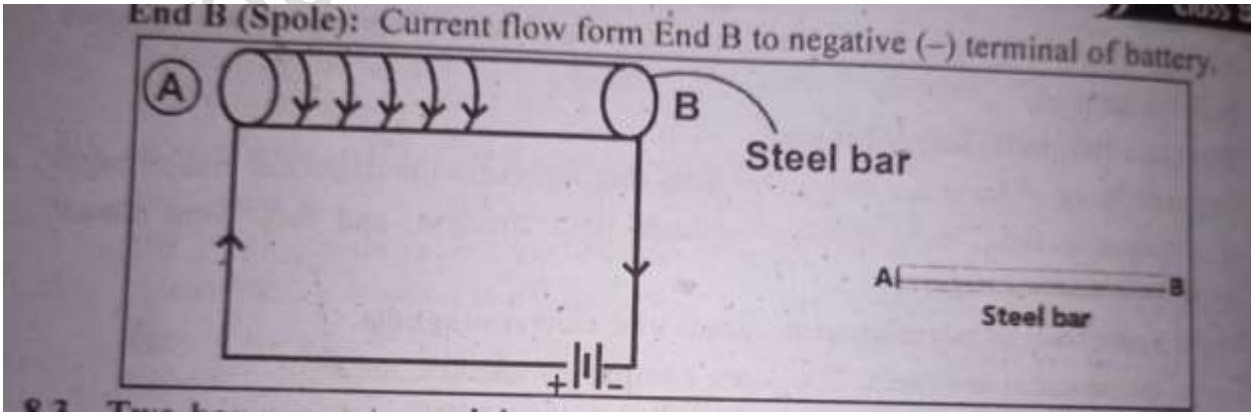
Magnet 1: P(N-pole) Q(S-pole)

Magnet 2: P(N-pole) Q(S-pole)

8.2 A steel bar has to magnetised by placing it inside a solenoid such that end A of a bar becomes N-pole end B becomes S-pole. Draw circuit diagram of solenoid showing steel bar inside it.

Ans. End A (N-pole): Current flow form (+) terminal of battery to end A.

End B (S pole) : current flow from End B to negative (-) terminal of battery.



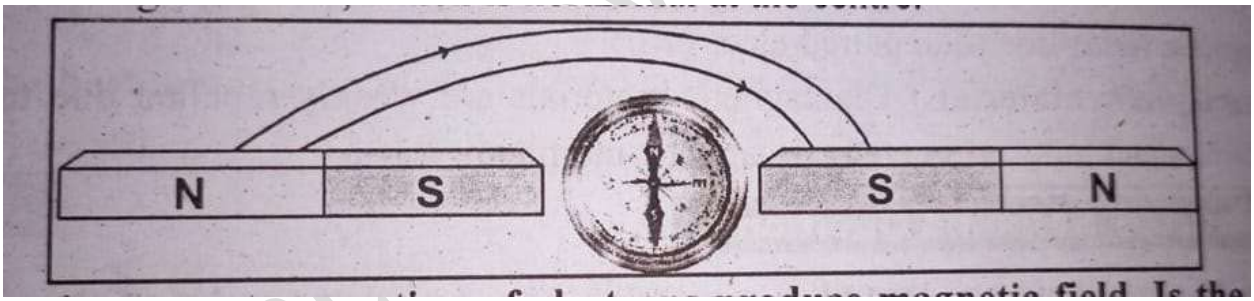
8.3 Two bar magnets are lying as shown in the figure. A compass is placed at the middle of the gap. Its needle settles in the north-south direction. Label N-and S poles of the magnets. Justify your answer by drawing field lines.

Ans. Magnet 1: S-pole (Left) and N-pole (Right)

Magnet 2: S-pole (Right) and N-pole (left).

Justification : The compass.needle settles in the north-south direction, the magnetic field lines at the middle of the gap must be from north to south.

Field lines : The field lines should show the magnetic field lines emanating from the North poles and converting into the south poles of both magnets. The lines should show a repulsive force between like poles. The compass needle aligns with the net magnetic field, which is horizontal at the centre.



8.4. Electric current or motion of electrons produce magnetic field. Is the reverse process true, that is the magnetic field gives rise to electric current? If yes, give an example and describe it briefly.

Ans. Yes, the reverse process is true. A changing magnetic field can induce an electric current. This phenomenon is known a electromagnetic induction

Example : Generation of electricity in a coil. Consider a coil of write places near a bar magnet. When the magnet is moved towards or away from the coil, a changing magnetic field is crated.

This changing magnetic field induces an electric current in the coil.

8.5 Four similar solenoids are placed in a circle as shown in the figure. The magnitude of current in all of them should be the same. Show by diagram, the direction of current in each solenoid anyone solenoid is switched OFF, the net magnetic field at the centre O is directed towards that solenoid. Explain your answer.

Ans. Explaniation : To achieve the desired magnetic field direction, the current in each solenoid should flow as follows:

Solenoid 1:

Clockwise

Solenoid 2:

Counter clockwise

Solenoid 3:

Clockwise

Solenoid 4:

Counterclockwise

when current in anyone solenoid is switched OFF, the net magnetic field at the center O will be directed dowards that solenoid due to the remaining magnetic fields from the other three solenoids.