Chapter 8 — Magnetism

Exercise Short Questions (with Answers)

Class 9 Physics (New Syllabus) — Board Level

Q 8.1. What are temporary and permanent magnets?

Ans: Temporary magnets work only in the presence of the magnetic field of a permanent magnet or a current, and lose their magnetism when that field vanishes. Soft iron, paper clips and electromagnets are examples. Permanent magnets retain their magnetism forever. Cobalt, alnico and ferrite are permanent magnetic materials.

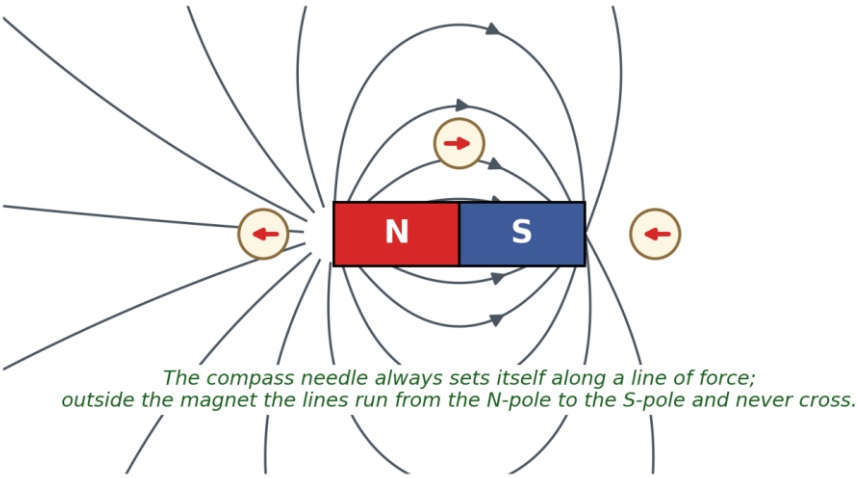
Q 8.2. Define magnetic field of a magnet.

Ans: A magnetic field is the region around a magnet where another magnetic object experiences a force on it. The magnetic field at a point has both magnitude and direction. Its direction at any point is the direction indicated by the N-pole of a compass needle placed there.

Q 8.3. What are magnetic lines of force?

Ans: When iron filings are sprinkled on a glass plate over a bar magnet and tapped, they set into a definite pattern. The lines corresponding to the paths of these filings are called magnetic lines of force. Outside the magnet they run from the N-pole to the S-pole and never cross.

Q 8.3 Magnetic lines of force around a bar magnet



The compass needle always sets itself along a line of force; outside the magnet the lines run from the N-pole to the S-pole and never cross.

Q 8.4. Name some uses of permanent magnets and electromagnets.

Ans: Permanent magnets are used in D.C motors, A.C and D.C generators, moving coil loudspeakers, door catchers, refrigerator door strips, and in flour mills to separate iron pieces from grain. Electromagnets are used in electric bells, telephone receivers, magnetic relays, circuit breakers, electromagnetic cranes, tape recorders and maglev trains.

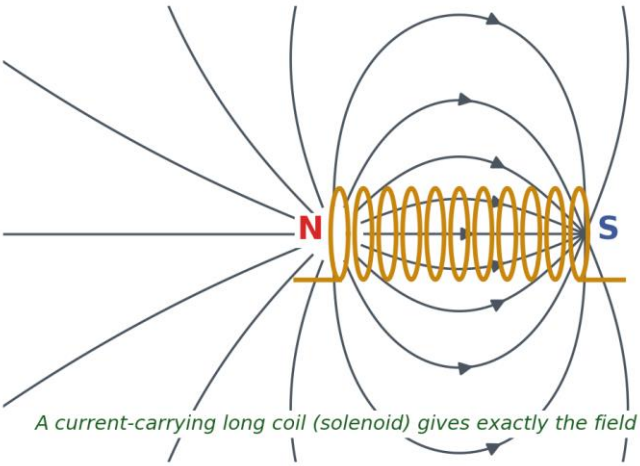
Q 8.5. What are magnetic domains?

Ans: In ferromagnetic materials, large groups of neighbouring atoms of the order of 10^{16} have their electron spins naturally aligned parallel. Such a group forms a highly magnetised region of about 0.1 mm, called a magnetic domain. Each domain behaves as a small magnet with its own north and south poles.

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

Ans: A current-carrying long coil (solenoid) produces a magnetic field exactly like that of a bar magnet. One end act as the N-pole and the other as the S-pole, and the field inside is nearly uniform. The polarity is found by the right-hand grip rule.

Q 8.6 Magnetic field of a current-carrying long coil



A current-carrying long coil (solenoid) gives exactly the field pattern of a bar magnet

Q 8.7. Differentiate between paramagnetic and diamagnetic materials.

Ans: In paramagnetic materials the orbital and spin fields of the electrons in an atom support one another, so the atom behaves like a tiny magnet. Aluminium and lithium are examples. In diamagnetic materials these fields add up to zero, so the atom has no resultant field. Copper, bismuth and water are examples.

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