Class X: Science

Chapter 13: Magnetic Effects of Electric Current

Chapter Notes

Key Learnings:

1. A compass needle behaves as a small magnet. Its one end pointing towards north is called a north pole, and the other end pointing towards south, is called a south pole.

2. The space around a magnet in which the force of attraction and repulsion due to the magnet can be detected is called the magnetic field.

3. A field line is path along which a hypothetical free north pole would tend to move. The direction of the magnetic filed at a point is given by the direction that a north pole placed at that point would take. Field lines are shown closer together where the magnetic filed is greater.

4. The magnetic field lines around a straight conductor carrying current are concentric circles.

5. The direction of magnetic field is given by Right Hand Thumb Rule.

6. The magnetic field inside a solenoid is similar to that of a bar magnet.

7. A current-carrying conductor when placed in a magnetic field experiences a force.

8. Fleming's left-hand rule gives the direction of magnetic force acting on a conductor.

9. An electromagnet consists of a core of soft iron wrapped around with a coil of insulated copper wire.

10. An electric motor is a device that converts electric energy into mechanical energy and it works on the principle of force experienced by a current carrying conductor in a magnetic field.

11. The phenomenon in which an electric current is induced in a circuit because of a changing magnetic field is called electromagnetic induction.

12. The magnetic field may change due to a relative motion between the coil and a magnet placed near to the coil. If the coil is placed near to a current carrying conductor, the magnetic field may change either due to a change in the current through the conductor or due to the relative motion between the coil and conductor.

13. Fleming's right hand rule is used to find the direction of induced current.

14. Electric generators are based on the principle of electromagnetic induction and converts mechanical energy into electrical energy.

15. In our houses we receive AC electric power of 220 V with a frequency of 50 Hz.

16. One of the wires in the electricity wiring of houses is with red insulation, called live wire. The other one is of black insulation, which is a neutral wire. The third is the earth wire that has green insulation and this is connected to a metallic body deep inside earth.

17. The potential difference between live wire and neutral wire is 220 V.

18. Third wire in the wiring is used as a safety measure to ensure that any leakage of current to a metallic body does not give any server shock to a user.

19. Fuse is the most important safety device used for protecting the circuits due to short circuiting or overloading of the circuits.