Ch-12 Magnetic Effects of Electric Current

1. Magnet has two poles, North pole and South pole. Like poles repel and unlike poles attract each other.
2. **Magnetic field –** The region around a magnet in which the force of attraction or repulsion produced by magnet can be detected.
3. **Magnetic field around a straight current carrying conductor –** Magnetic field produced by a conductor at a distance 'r' in vacuum is
    a. Proportional to current (I), and
    b. Inversely proportional to the distance (r).

    Direction of field is given by Right Hand Thumb Rule.
4. **Magnetic field due to current carrying wire through a circular loop –** Magnetic lines of force are circular near the wire and become parallel at the middle point 'M' of the coil.
5. **Magnetic field produced at the centre is –**
    a. Proportional to the current (I), and
    b. Inversely proportional to the radius (r).
6. **Properties of magnetic field lines –**
    a. They do not intersect each other.
    b. The direction of the magnetic field lines is from south to north.
    c. The direction of the magnetic field lines inside the magnet is from North to South.
7. **Magnetic field due to current flowing in solenoid –**
    a. Solenoid – Long coil of many turns of insulated copper wire wrapped in the shape of a cylinder.
    b. Magnetic field produced by a solenoid is similar to bar magnet.
    c. Strength of magnetic field is proportional to number of turns and magnitude of current.
8. **Electromagnets –** An electromagnet consists of a long coil of insulated copper wire wound on a soft iron core.
9. **Electric Motor –**
    a. A device that converts electrical energy to mechanical energy.
    b. Principle – When rectangular coil is placed in magnetic field and current is passed through it coils experience a torque, which rotates it continuously.
10. **Electromagnetic Induction –**
    a. Phenomenon of inducing an electric current in a coil by changing magnetic field around it.
    b. Direction of induced current by Fleming right hand rule –
        i. Forefinger – magnetic field
        ii. Centre finger – induced current
        iii. Thumb – motion of conductor
11. **Electric Generator**
    a. Converts mechanical energy into electrical energy.
    b. AC Generator – Produce current which changes direction after equal interval of time.
    c. DC Generator – Produce current which is unidirectional.