DEPARTMENT OF EDUCATION (S)
Government of Manipur

CLASS X
PHYSICS
CHAPTER 9 – MAGNETISM

NOTES

- **Magnet -** It is a substance which attracts pieces of iron, nickel, cobalt and steel. This property of attraction is called magnetism. Any magnet has two poles - North pole and South pole irrespective of shape.
- **Compass needle -** It is a very light needle-shaped magnet pivoted at its centre and free to rotate about the pivot in a horizontal plane.
- **Magnetic field -** It is the space around a magnet in which magnetic force is experienced.
- **Magnetic lines of force -** They are the imaginary lines drawn in a magnetic field along which a north pole would move.
- **Magnetic lines of force around a bar magnet is shown in figure below -**

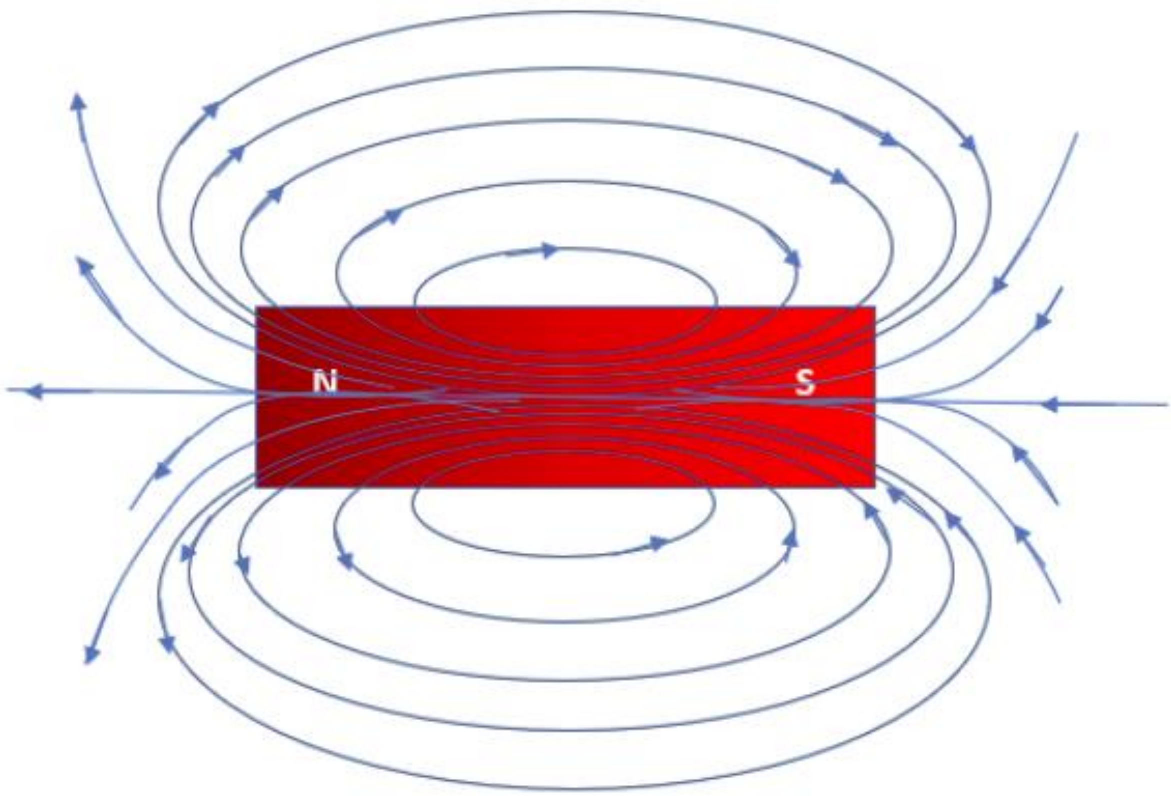
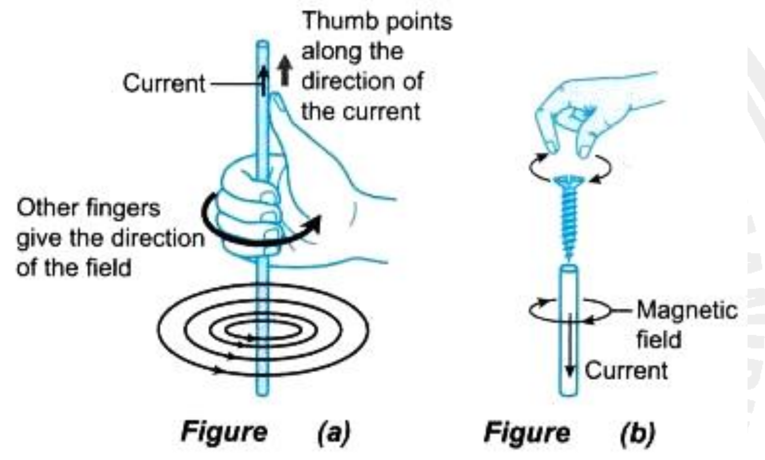


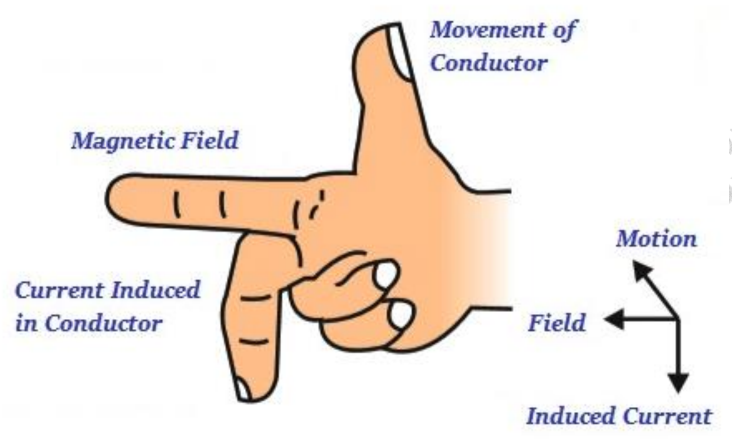
Fig. Magnetic lines of Force around a Bar Magnet

- **Magnetic effect of electric current or electromagnetism -** A current carrying conductor is always associated with a magnetic field around it.
- **Magnetic field due to a straight conductor carrying current –**

  i) The direction of the magnetic field is reversed if the direction of current is reversed.

  ii) The strength of magnetic field decreases as the distance from the wire increases.
- **Right hand thumb rule-**The current carrying conductor is held with the right hand such that the thumb points towards the direction of electric current. Then the direction in which the remaining fingers curl gives the direction of the magnetic field.





Fleming's right-hand rule

Fig. Fleming's Right-Hand Rule

- **Solenoid -** A solenoid is a long coil of many circular turns of insulated copper wire wrapped closely in the shape of cylinder whose radius is very small in comparison with the length of the winding.

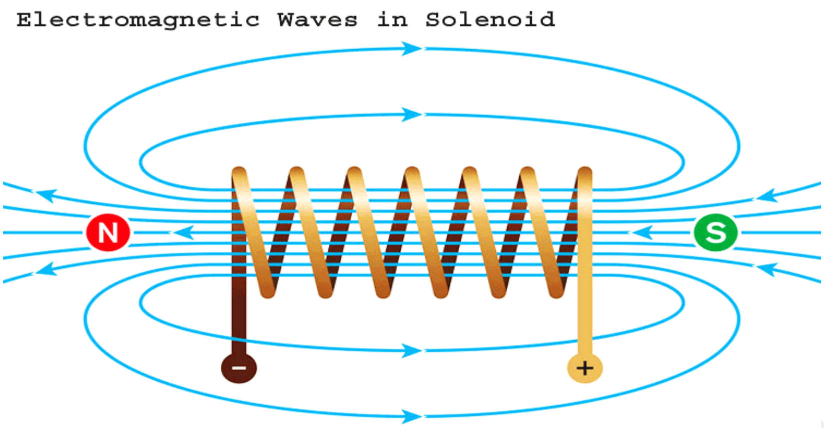


Fig. A Solenoid

- **Force on a current carrying conductor placed in a magnetic field:**

i) When a current carrying wire is placed in a magnetic field, a force acts on the wire.

ii) The direction of the force depends on the direction of the magnetic field and the direction of the current.

- **Fleming's left hand rule -** Stretch the thumb, forefinger and middle finger of left hand such that they are mutually perpendicular. If the forefinger points in the direction of magnetic field and middle finger points in the direction of current, then the thumb will point in the direction of motion.

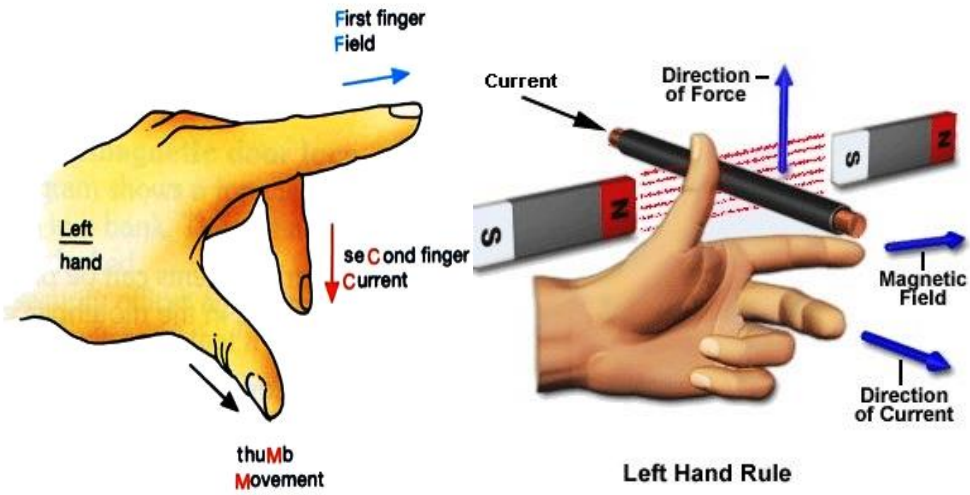


Fig. Fleming's left hand rule

- **Electric motor** - An electric motor is a rotating device that converts electrical energy to the mechanical energy of a rotating system known as the shaft.

Working of electric motor :

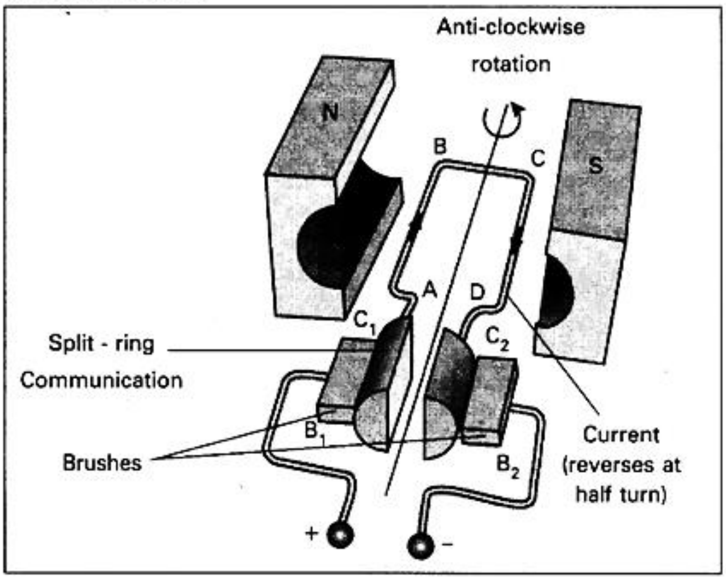


Fig. Working of Electric Motor

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