Class-X(Cancept Map)

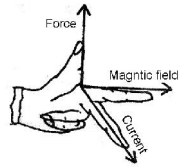
MAGNETIC EFFECT OF CURRENT

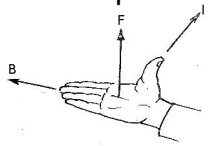
Magnet

- Types
  - Artificial magnet
    - Temparory magnet
    - Permanent magnet
  - Natural magnet
- Properties
  - Attractive property
  - Directional property
  - Pole always exist in pair
  - •Same pole repel each other
    •opposite pole attract each other

Force on current carrying conductor in magnetic field

- Magnitude: $F=IlB\sin\theta$
- Direction of the force
  - •Fleming left hand rule
  - •Right hand palm rule



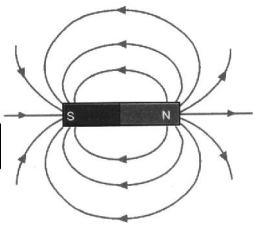


Electromagnetic induction

- Due to change in magnetic flux current induces
- Direction of the emf
  - •Fleming right hand rule
  - •Lenz rule

Field lines

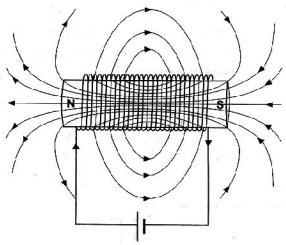
- Tangential drawn at any point gives the direction of field
- Field strength depends on the closeness of the field lines
- From north to south pole in form of closed curve



Field due to current carrying conductor

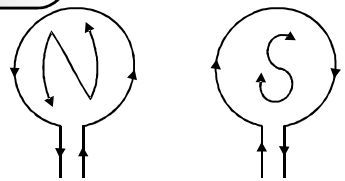
Solenoid

- Field strength
  - $\propto$ Numbers of turns
  - $\propto$ Current
  - $\propto$Nature of core material
  - $B=\frac{N\times\mu_o\times I}{2\pi r}$

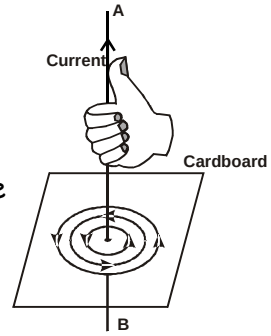


Circular loop

- Field strength
  - $B=\frac{N\times\mu_o\times I}{2r}$
  - $\propto$ current
  - $\propto \frac{1}{\text{distance}}$
  - $\propto$ Numbers of turns
- Polarity of coil: Clock rule



Anticlockwise Current Clockwise Current

Straight conductor

- Field strength
  - $\propto$ current
  - $\propto \frac{1}{\text{distance between magnet and conductor}}$
- Direction of the field
  - •Right hand thumb rule
  - •Maxwell's screw rule