

Magnetic effect of electric current

10th (Physics)

Date ...~~20~~/4/20

* Oersted experiment :- For this experiment

refer NCERT activity 13.4 and figure 13.5

→ This experiment gives the relationship between electricity and magnetism.

→ Direction of deflection of compass needle is given by Ampere's Swimming Rule or SNOw rule.

* Ampere Swimming Rule :-

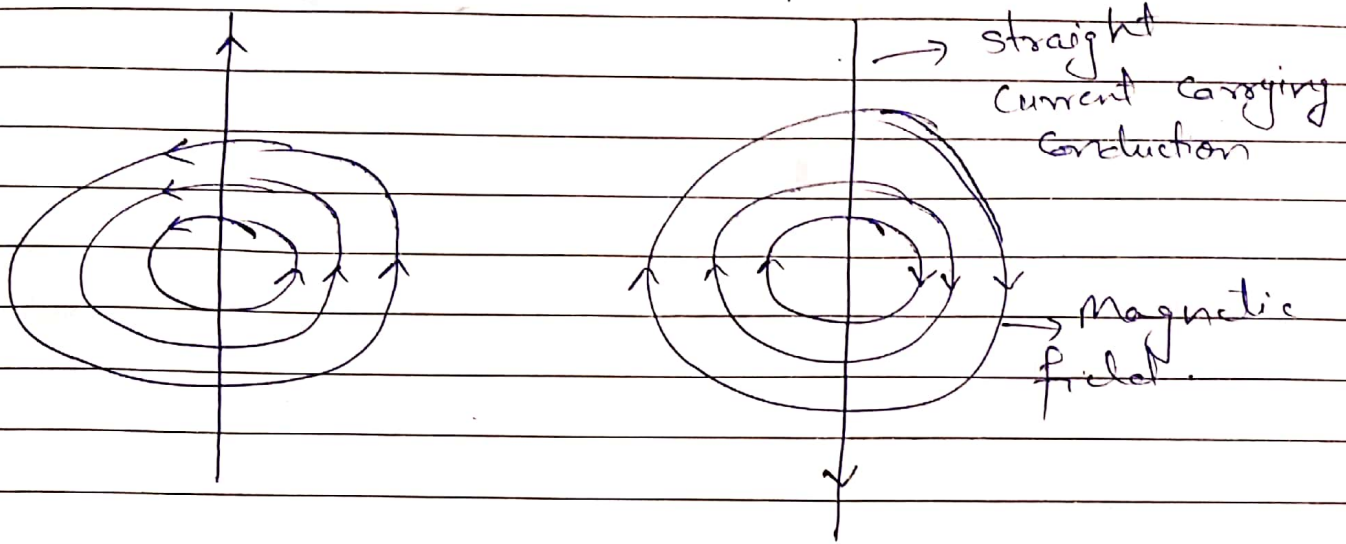
Consider a man swimming along the direction of wire, if electric current enters his feet and leaves his head, then north pole of needle will deflect toward his left hand.

* SNOw Rule :-

If electric current flows from South to North direction in a wire kept over a compass needle then North pole of needle will deflect towards West.

* Magnetic field due to the current carrying straight conductor :

When electric current is passed through a straight conductor, it creates magnetic field around the wire. The direction of this magnetic field is given by Right hand thumb Rule.



* Right hand thumb Rule :

According to this rule, if we hold a current carrying conductor in right hand such that thumb points in the direction of current, then the direction of curling fingers gives the direction of magnetic field.

* Factors on which magnetic field due to straight current carrying conductor depend :

1. Strength of magnetic field is directly proportional to the amount of current flowing through it.

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i.e $B \propto I$

Note: Magnetic field is denoted by B.

1. It means that if current increase, the magnetic also increase and vice-versa.

2. Strength of magnetic field is inversely proportional to the distance from the current conductor.

i.e $B \propto \frac{1}{r}$

It means that if distance from the conductor increase then magnetic field will decrease and vice-versa.