PHYSICS

CLASS NOTES FOR CBSE

Chapter 06. Electricity

Electricity is an important source of energy

01. Types of Electric Charges

There are two types of electric charges : *positive* charge and *negative* charge. Important property of electric charges.

(i) Opposite charges (or Unlike charges) attract each other.

(ii) Similar charges (or Like charges) repel each other.

The SI unit of electric charge is coulomb which is denoted by the latter C.

A Proton possesses a positive charge of 1.6×10^{-19} C whereas an electron possesses a negative charge of 1.6×10^{-19} C.

The SI unit of electric charge 'coulomb' (C) is equivalent to the charge contained in 6.25×10^{18} electrons.

02. Electric Potential

The electric potential (or potential) at a point in an electric field is defined as the work done in moving a unit positive charge from infinity to that point.

03. Electric Potential

The potential difference between two points in an electric circuit is defined as the amount of work done in moving a unit charge from one point to the other point.

$$\text{Potential difference} = \frac{\text{Work done}}{\text{Quantity of charge moved}}$$

04. Electric Current

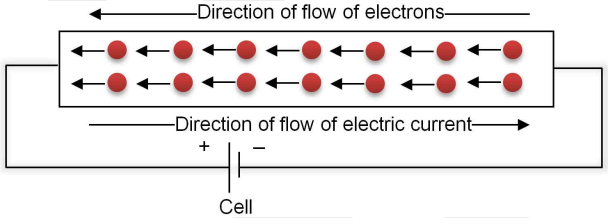
It is the potential difference between the ends of the wire which makes the electric charges (or current) to flow in the wire.
The electric current is a flow of electric charges (called electrons) in a conductor such as a metal wire.

$$\text{Current,} \quad I = \frac{Q}{t}$$

The SI unit of electric current is ampere.
When 1 coulomb of charge flows through any cross-section of a conductor in 1 second, the electric current flowing through it si said to the 1 ampere.
Current is measured by an instrument called ammeter. Ammeter is always connected in *series* with the circuit in which the current is to be measured.
An ammeter should have very low resistance.

05. How the Current Flows in a Wire

Electric current is a flow of electrons in a metal wire (or conductor).



06. OHM'S Law

At constant temperature, the current flowing through a conductor is directly proportional to the potential difference across its ends. The ratio of potential difference applied between the ends of a conductor and the current flowing through it is a constant quantity called resistance.

We have just seen that : $\frac{V}{I} = R$

or $V = I \times R$

or $\frac{V}{R} = I$

So, Current, $I = \frac{V}{R}$

(i) the current is directly proportional to potential difference, and
(ii) the current is inversely proportional to resistance.

If the potential difference across the ends of a conductor is doubled, the current flowing through it also gets doubled, and if the potential difference is halved, the current also gets halved.