

Electric current

- (i) Net charge flowing across the cross section of the conductor in one second is called *electric current*.

$$i = Q / t \quad \text{or} \quad Q = it$$

- (ii) S.I. unit of current is ampere

$$1 \text{ ampere} = \frac{1 \text{ coulomb}}{1 \text{ second}}$$

- (iii) The current flowing through a conductor is said to be one ampere when one coulomb of charge passes through it in one second.

- (iv) If 6.25×10^{18} electrons pass across the cross-section of a conductor in one second, the strength of the current flowing across the conductor is one ampere.

Ohm's law

At constant temperature, the current (i) flowing through a conductor is directly proportional to the potential difference (V) between its ends.

$V \propto i$ or $V = iR$ where R is the electrical resistance of the conductor

- a) Ohm's law is not a universal law.

- b) Conductors which obey Ohm's law are called **ohmic** (or) **linear conductors**. Ex. metals.

- c) The graph between V and I for ohmic conductor is straight line passing through the origin.

- d) Conductors which do not obey Ohm's law are called **Non ohmic** (or) **Non linear conductors**.

Ex: Carbon compounds, electrolytes, transistors, diodes, semiconductors, discharge tubes, Thermionic valves, vacuum tubes.

- e) The graph between V and i for non ohmic resistance is a curve

