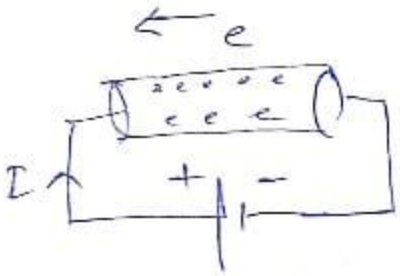
Class - X+1

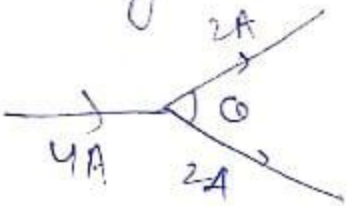
Chapter: ELECTRIC CURRENT

Electric Current: Flow of electric charge through a Conductor



The Direction of flow of electron and electric charge opposite to each other.

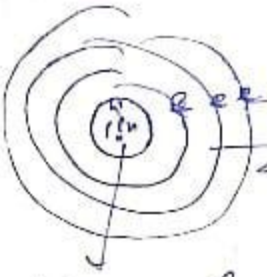
Electric current is a Scalar physical quantity $I = \frac{q}{t}$ SI unit is Ampere. It is a fundamental physical quantity



what ever be the Angle But Resultant is of 4A

Electric Current is flow of Electron Charge → +ve proton
→ -ve electron

only electron flow is possible not proton. proton is bounded inside Nucleus



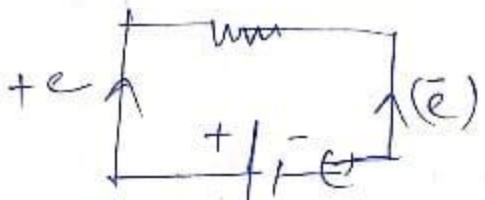
electrons are in outer most orbit

Nucleus (P+N)

Electric potential Difference

Amount of work done to move Charge from one point to Another point known as potential Difference.

Positive charge move from Higher potential to lower or Electron move from lower to Higher



potential diff is Responsible for flow of electric Current

$V = \frac{W}{Q}$ → Amount of work done

Q → charge

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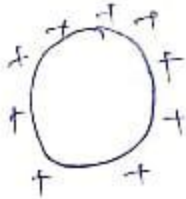
SI unit of electric potential is Volt

$$1\ \text{Volt} = \frac{1\ \text{Joule}}{1\ \text{Coloumn}}$$

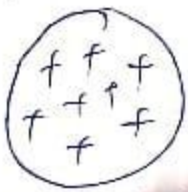
Conductors & Insulator

One which allow to pass electric current through itself known as conductors. metals are good conductors of heat and electricity. conductors are having large no free electrons



Charge always present on outer surface of conductors

Insulators: doesn't allow to pass electric ~~conduct~~ current. It is having bounded electrons



Not free electrons

Non metals are insulators

George Simon ohm's law

Electric potential is directly proportional to electric current

$$V \propto I$$

$$V = RI$$

R = proportionality constant
Known as Resistance

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

$$R = \frac{1\ Volt}{1\ Amp}$$

"Ohm is SI unit of Resistance"

Resistance is the property of a material which Resist the flow of electron

Resistance depends upon following factors

- Length
- Area
- Nature
- Temp

$$R \propto l \quad \text{---(i)}$$

$$R \propto \frac{1}{A} \quad \text{---(ii)}$$

$$R = \frac{\rho l}{A}$$

$$\rho = \frac{RA}{l}$$

ρ → proportionality Const
Specific Resistance / Resistivity

SI unit of Resistivity is $\frac{\Omega \times m^2}{m} = \Omega m$

Experimental Study of ohm's law

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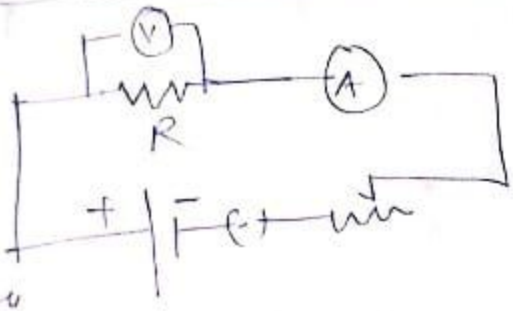
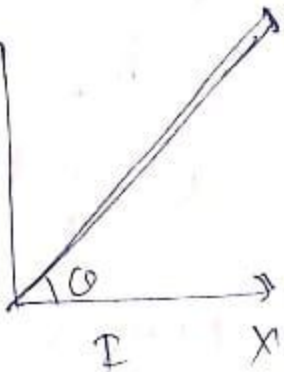


Voltmeter Reading	V	1	1·1	1·2	1·3
Reading of Ammeter	A	1	1·1	1·2	1·4



$\tan\theta = \frac{V}{I}$

$\theta = 45°$

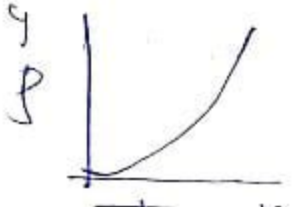
$\tan 45° = 1$

Change the value of Voltmeter with the help of Rheostate the reading of Ammeter changes.

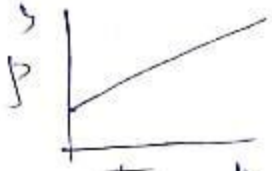
Metals are good conductor of heat and electricity due to large no of free electrons.

Resistance changes by changing Temp

Resistivity of a conductor is Independent on Dimension only Depends upon nature and Temp



Conductor
Aluminium

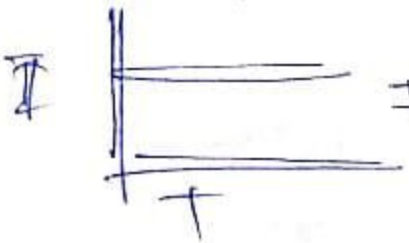


Alloy

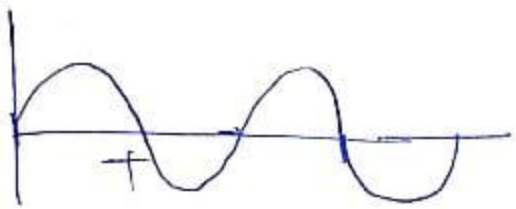
Semicondu
Germani

Note: Electric current is of two types

- DC Direct Current
- Ac Alternating Current



Magnitude fixed



Simultaneously +ve half -ve half