ELECTRICITY

CHARGE

→ Positive Charge (Proton) 1.6×10^{-19} C

→ Negative Charge (Electron) -1.6×10^{-19} C

Unlike charge attract each other.

Like charges repel each other.

S.I. Unit of charge is **Coulomb.**

Charge at rest → **Static Electricity**

Charge in motion → **Current Electricity**

Flow of charge in a closed circuit.
Direction of flow of positive charge is the direction of flow of conventional current.
Direction of current is opposite to the direction of Flow of electron in the circuit.

Electric Current
I = q/t
S.I. Unit is **Ampere.**

Flow of charge in unit time.
Flow of electrons in a conductor when cell or battery Is applied across its end.
1 A = 1 Cs^{-1}
Measured by **Ammeter**

Electric Potential Difference
V = W/q
S.I. Unit is **Volt**

Work done in moving a unit Charge from one point to one another.
Measured by **Voltmeter**

Both are related by Ohm's Law

Ohm's Law iα V; i.e. Vα i
At constant temperature

The ratio V/I is constant
Graph between V and I is a straight line inclined to X axis..
Slope of V I graph resistance of the given conductor at a given temperature.

Proportionality constant

I α V
I $\alpha \frac{1}{R}$

Resistance R = $\frac{V}{i}$
S.I. unit of R is Ohm
Ω

It opposes the flow of current through the Conductor.
1 Ohm = 1 VA^{-1}

depends on

length of the conductor
Area of Cross Section

$R\alpha \frac{1}{A}$; $R = \rho \frac{1}{A}$

Where ρ is constant known as

Resistivity or Specific Resistance $\rho = \frac{RA}{L}$

S.I. unit of resisitivity is Ohm-metre.
Low resistivity good conductor.
Independent of thickness and length of the wire.

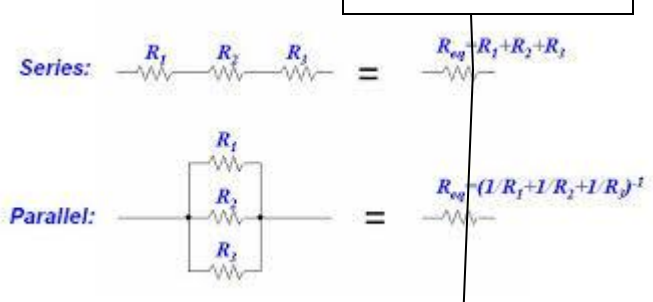
Connect in combination of

Series Resistances

Parallel resistances

Specific Resistance or Resistivity

Parallel Resistances



In parallel voltage across each resistor is same.

Current divided in each branch I = $\frac{1}{R}$

I = $i_1 + i_2 + i_3$

Equivalent resistance is $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$

Series Combination

Depends on

Nature of material
Temperature of substance.

Same current passes through each resistor.

Different potential differences across different resistors. V α
RType equation here.

V = $V_1 + V_2 + V_3$

Heating Effects of Electric current

Joule's Law H = i^2R t

House hold consumption of electricity is given in KiloWatt Hours. 1 KWH = 3.6 x 10^6Joules.