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## CHAPTER 1. (ELECTRICITY) (BASED ON NCERT PATTERN)

**Electric Current:- The electric current is the rate of charge flow past a given point in an electric circuit**

**I = Q/t, Where I = Current, Q = Net charge flow, t = time**

- **Unit: The unit of current is Ampere.**

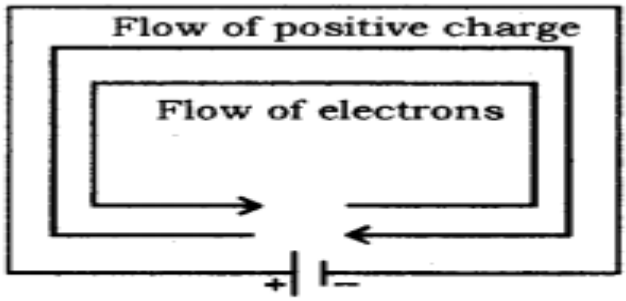
  **Q = Coulomb(C)**

  **I = Ampere(A)**

  **t = Second(s) 1 A = 1C/1s**

**By convention, electric current flows in the opposite direction to the movement of electrons.**

**Electric current is denoted by the letter 'I'. Electric current is expressed by the rate of flow of electric charges. Rate of flow means, the amount of charge flowing through a particular area in unit time.**




Conventional flow of electric charge.

**If a net electric charge (Q) flows through a cross-section of a conductor in time t, then,**

$$\text{Electric current (I)} = \frac{\text{Net charge (Q)}}{\text{Time } (t)} \quad \text{or,} \quad \boxed{I = \frac{Q}{t}}$$

**Where I is electric current, Q is a net charge and t is a time in second.**

**Electric potential:-** **the amount of work needed to move a unit charge from a reference point to a specific point against an electric field.**

- **Potential Difference:**

**The potential difference between two separate points is defined as the work done to move a unit positive charge from one point to another.**

**V = W/Q**

**The unit of potential difference is Volt**

**1 Volt = 1 Joule/ 1 Coulomb**

**Ohm's Law: Under constant physical conditions (i.e., constant temperature, pressure etc.), the current flowing through a conductor is directly proportional to the potential difference across the conductor**

**Current ∝ potential difference**

**V ∝ I**

**V = I R where, R = Resistance**

- **Unit R = Ω(Ohm)**

**1Ω = 1V / 1 A**

**Factors on which resistance depends:**

- **R ∝ 1, when A and material constant *l* = length**
- **R ∝ 1/ A, when l and material constant *A* = perpendicular cross-section**

**R ∝*l* / A,**

**R = ρ*l* / A, where ρ = resistivity**