CLASS 10

CONCEPT MAP

CHAPTER – 12

ELECTRICITY

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ELECTRIC CIRCUIT

Closed continuous path through which electric current flows.

Open Circuit: Circuit through which no current flows.

Closed Circuit: Circuit through which current flows.

AMMETER

Instrument used to measure electric current in a circuit.

ELECTRIC CURRENT

- Rate of flow of electric charge
- Represented by the letter "I"
- SI Unit – Ampere (A)

JOULE'S LAW

States that heat produced in a conductor/resistor is directly proportional to square of the current, directly proportional to the resistance and directly proportional to the time for which current flow through conductor

$H=I^2Rt$

ELECTRIC CHARGE

- Physical characteristics of matter
- Represented by letter "q"
- SI Unit –Coulomb (C)

OHM'S LAW

States that electric current flowing through a conductor is directly proportional to the potential difference across its ends.

$V \propto I$

$V=IR$

RESISTANCE

Property of a material to oppose the flow of electric current

TOTAL RESISTANCE

SERIES:

$R= R1+R2+R3+\ldots\ldots$

PARALLEL:

$$\frac{1}{R}=\frac{1}{R1}+\frac{1}{R2}+\frac{1}{R3}\ldots\ldots$$

APPLICATIONS OF HEATING EFFECT OF ELECTRICITY

Used in electric oven,heater,toaster etc NICHROME is used .

Used in bulbs to produce light. TUNGSTEN is used.

Used as fuse in electric circuits. Alloy of tin and lead is used

ELECTRIC POWER

Rate of change of electrical energy dissipated or consumed in an electric circuit.

$P=I^2R$

Or

$P=V^2/R$

ELECTRIC POTENTIAL DIFFERENCE

- Work done in carrying a unit charge from one point to another in an electric circuit
- Represented by letter "V"
- SI Unit -Volt (V)

VOLTMETER

Instrument used to measure electric potential difference in a circuit.

FACTORS ON WHICH RESISTANCE DEPENDS

- Directly proportional to length of the material
- Inversely proportional to the area of cross section
- Nature of material

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