

## **PHYSICS LESSON NOTE FOR SS ONE**

**DATE:** 3<sup>RD</sup> APRIL, 2020

**TOPICS:** ELECTRIC CURRENT

**SUB-TOPICS:** POTENTIAL DIFFERENCE, E.M.F AND OHMS LAW

**OBJECTIVES:** At the end of the lessons, Students should be able to:

- 1 explain potential difference
2. explain electro motive force
3. state ohm law.

**Contents:**

**Introduction**

**Potential Difference**

This is the work done in taking a unit positive charge from one point to another in an electrical circuit. Its unit is in volts.

**Electro Motive Force (E.M.F):** This is the p.d across the terminal of a cell when it is not delivering current too the external circuit.

**Electric Current:** This is the flow of charges per unit time in a conductor. It is given as  $I = Q/t$ . Where current is measured in amperes A, Charge Q in Coulombs and t in seconds.

**Resistance:** This is the opposition to the flow of electric current. It is measured in ohms

**OHM'S LAW**

This is the law that shows the relationship between Voltage, Current and resistance.

It states that the current ( I) flowing through a metallic conductor is directly proportional to the P.d (V) across its terminal provided that temperature and other physical conditions remain constant. i.e

$$V \propto I \Rightarrow V = IR.. \text{ where R is resistance}$$

Materials that do not obey ohms law

- 1 Tungsten
- 2 Diode
3. Transistor

Factors that affect electrical resistance of a conductor

- 1 Temperture
2. Length of the Conductor
3. Area
4. Nature of the material

The relationship between the factors that affect the resistivity of a material is given as  $R = \rho L/A$  where  $\rho$  is called Resistivity of a material and its unit is ohm- metre

Therefore,  $\rho = RA/l$ . Also Conductivity  $\sigma$  is given as  $\sigma = 1/\rho$ . unit is  $(\text{ohm- metre})^{-1}$ .

#### ASSIGNMENT

State two other materials that do not obey ohms law.