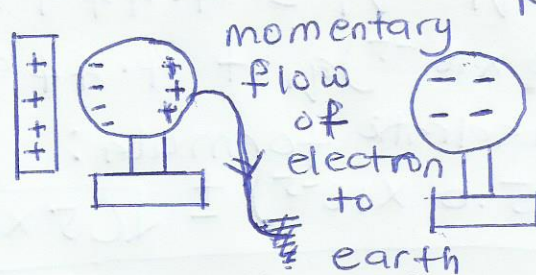
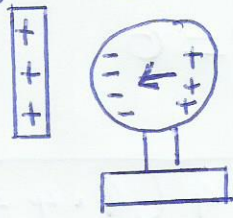


NAME: JACKSON NSIDIBE ABASI INIUBONG
 MATRIC NO: 18/MHS02/095, NURSING, 200L, (C.O)
 COURSE CODE: PHY 102
 SECTION A:

①

1a Positively charged rod



Negatively charged sphere

A neutral conducting sphere is at rest on top of an insulating stand. A positively charged rod is brought near to (without touching) the neutral sphere. The presence of the positively charged tube forces electron movement from right to left side of the sphere.

This movement of electrons is merely a reaction to the presence of positive charge. Once touched by the ground, the electrons leaves the sphere. When the tube is moved away, there is an overall negative charge left on the sphere.

①b

Let the value of the individual charges be q_1 and q_2 . The condition on the combined charge of the sphere is given as:

$$q_1 + q_2 = 5.0 \times 10^{-5} \text{ C} \quad \text{--- (1)}$$

Both charges are positive because their sum is positive and they repel each other, thus:

$$\text{Using } F = \frac{kq_1q_2}{r^2} = 1.0 \text{ N}$$

$$q_1q_2 = (1.0 \text{ N}) \frac{r^2}{k} = (1.0 \text{ N})(2.0 \text{ m})^2 \times 8.99 \times 10^9 \text{ N} \cdot \text{m}^2/\text{C}^2$$

$$q_1q_2 = 4.449 \times 10^{-10} \text{ C}^2 \quad \text{--- (2)}$$

$$\text{From eqn (1) } \therefore q_2 = 5.0 \times 10^{-5} - q_1$$