NAME: ALEGBELEYE OLUWATOSIN OLUWAPELUMI

DEPARTMENT: ELECTRICAL ELECTRONICS ENGINEEERING

MATRIC NUMBER: 19/SCI01/015

NAME: ALEGBELEYE OLUWATOSIN OLUWAPELUMI

DEPARTMENT: ELECTRICAL ELECTRONICS ENGINEERING

MATRIC NO: 19/SCI01/015

ASSIGNMENT

① Using the concept of Newton's second law of motion, describe the magnitude and direction of the accleration of an electron being shot horizontally into a closed space with a uniform field being directed upward.

ANSWER

Newton's second law of motion states that the rate of change of momentum of a body is directly porportional to the force applied, and this change in momentum takes place in the direction of the applied force.

$F \propto \frac{m(v-u)}{t}$ recall, $a = \frac{(v-u)}{t}$

$F \propto ma$

The magnitude of the acceleration of an electron being shot horizontally into a closed space with a uniform field. Because it is uniform, the force acting on the electric field will be constant. Since the force acting on the electric field is constant then the force acting on the electron is also constant.

Following the second law of motion; force is directly porportional to acceleration. Since, the force is constant therefore the acceleration is also constant and so the magnitude of the acceleration acting on the electron is constant.

The direction of the acceleration of an electron being shot, for positive charges they act along / in the same direction as their electric field but negative charges act against / opposite the direction from it's electric field. Since the electron is a negative charge, the direction will be opposite its electric field and move towards the positive terminal of the electric field.

2.) ELECTRIC FIELD

Electric field is an electric property associated with each point in space when charge is present in any form or is the physical field that surrounds each electric charge and exerts force on all other charges in the field, either attracting or repelling them. The magnitude and direction of the electric field are expressed by the value of E, called electric field strength or electric field intensity or simply the electric field.

A charge produces an electric field, when a positive point charge produces an electric field it always point away from it but the electric field produced by a negative point charge it always points towards it.

MAGNETIC FIELD

A magnetic field is a vector field that describes the magnetic influence on moving electric charges, electric currents, and magnetized materials or a region of space near a magnet, electric current or moving charged particle in which a magnetic force acts on any other magnet or moving charged particle.

A charge moving in a magnetic field experiences a force perpendicular to its own velocity and to the magnetic field. Magnetic fields are the product of moving electric charges and intrinsic magnetic moments of elementary particles.

ELECTRIC CURRENT

An electric current is a stream of charged particles, such as electrons or ions, moving through an electrical conductor.

In a neutral body i.e has equal number of electrons and protons present, loses electrons, the body becomes positively charged but if the body gains electrons it becomes negatively charged.

Electric current is the rate of flow of negative charges of the conductor.