IGBA TISHA EMUOBOSA
19/ENG04/025
ELECTRICAL & ELECTRONICS ENGINEERING
ENG 221 - Basic Electrical Engineering

① Newtons second law of motion states that the rate of change of momentum of a body is directly proportional to the force applied, and the change in momentum take place in the direction of the applied force. It basically deals with the behaviour of objects for which all existing forces are unbalanced. Mathematically it is stated as,

$F = ma$ and $F \propto a$

Positive charges act in the same direction as the electric field while negative charges act in a direction against the direction of the electric field. Therefore, since the electron is negative, it, if will go in a downward direction which is different from the direction of the uniform field which is going in an upward direction.

The field we are dealing with is uniform and so the force acting on the field is constant, also, the force acting on the electron being shot into a closed space is also constant and since the force acting on the electron is constant and $F \propto a$ then the acceleration of the electron is also constant.

② Electric field

Electric field is defined as the force per unit charge. The direction of the the field is taken to be the direction of the force it would exert on a positive charge. A electric field is the physical field that surrounds each electric charge field and exerts force on all other charges in the field, either attracting or repelling them. The direction of an electric field is radially outward from a negative charge and inward towards a negative point

Electric field is mathematically represented as:

$$E = F/q$$

where:

E = Electric field

F = force

q = charge

Magnetic field

A magnetic field is a vector field that describes the magnetic influence on moving electric charges, electric currents and magnetized materials. A charge that is moving in a magnetic field experiences a force perpendicular to its own velocity and to the magnetic field. The magnetic field strength B based on the magnetic force $\vec{F}$ on a charge q moving at a velocity $\vec{v}$ ~~force is perpendicular to~~ as the cross product of the velocity and magnetic field, that is

$$F = qvB\sin\theta$$

Where F = Magnetic force

q = Charge of the particle

B = Magnetic field Strength

v = Velocity at which the charge is moving with

Electric Current

Electric current is the rate of flow of a positive electric charge. Current can be caused by the flow of electrons, ions or other charged particles. Electrons are negatively charged, so the direction electrons flow is the opposite direction to current