NWANGWU EMMANUEL CHIJIOKE
ELECTRICAL ELECTRONICS
19/ENG04/034

Question 1

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

Electrons are negatively charged, the electron in question will move downward as the electron is attracted by the positive charge and repelled by the negative terminal. The electron also opposes the direction of the electric field.

Acceleration: The acceleration will be constant throughout the electric field because the electric field is uniform. Since the electric field is uniform, therefore the magnitude and direction of the electric field will be constant. The force will be constant and the magnitude of the acceleration

Using Newton's second law which states that a body being acted upon by a force , the force is the product of the mass and the acceleration of that body in the direction of the force.

Mathematically expressed as F=ma. But for an electron F=Eq

ma= Eq

a=Eq/m

where,

a= acceleration of the electron

E= electric field or Electric field intensity

q= quantity of electric field and

m= mass of the electron.

Question 2

Describe electric field, magnetic field and electric current with respect to charges

ELECTRIC FIELD

Electric field E at any point may be defined as the electric, or Coulomb, force F exerted per unit positive electric charge q at that point, or simply E = F/q.

The direction of the field is taken to be the direction of the force it would exert on a positive test charge. The electric field is radially outward from a positive charge and radially in toward a negative point charge

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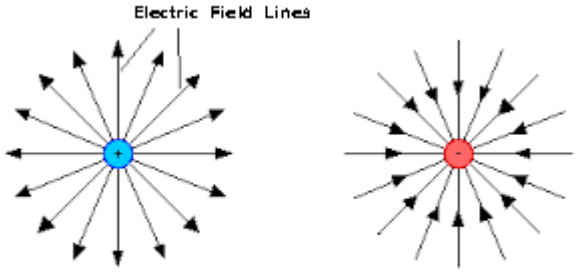
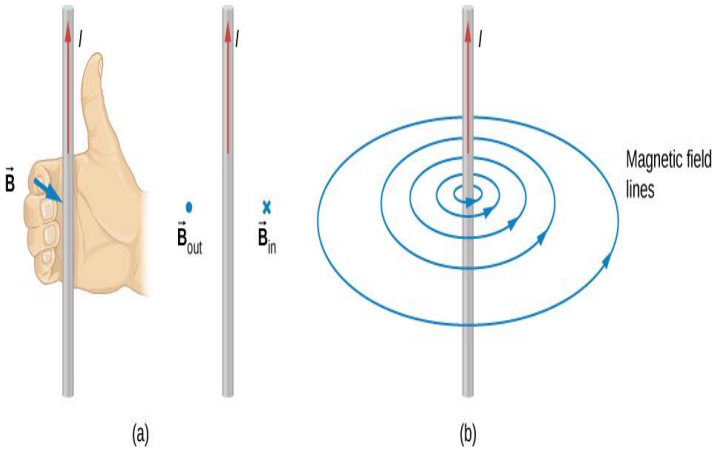


MAGNETIC FIELD

A region around a magnetic material or a moving electric charge within which the force of magnetism acts. A charge that is moving in a magnetic field experiences a force perpendicular to its own velocity and to the magnetic field. The force of magnetism is due to moving charge or some magnetic material. In other words, a current carrying conductor produces a magnetic field around it. The sub-atomic particles in the conductor like the electrons moving in atomic orbitals are responsible for the production of magnetic field.



Electric current

An electric current is a flow of electric charge in a circuit. More specifically, the electric current is the rate of charge flow past a given point in an electric circuit. The charge can be negatively charged electrons or positive charge carriers including protons, positive ions or holes.

If a neutral object loses electrons, it becomes more positively charged. If a neutral object gains electrons, it becomes negatively charged

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