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QUESTION 1

Using the concept of Newton’s second law 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 upwards.

ANSWER

Using the second law of motion which states the rate of change of a momentum of a body is directly proportional to the force applied at a direction to the force.

Therefore, force=ma, where m is mass and a is the acceleration, the positive and negative charges act in opposite directions inward and outward directions of the electric field. The force acting on an electron being shot into a closed space is constant due to the field uniformity so the force acts on that same field is constant. The magnitude of the force is given by F=Gq, where E is the electric field strength and q is the charge of the electron so no force acts horizontally. THE DIRECTION OF a (acceleration) is downward just like the way force, F, is directed because according to Newton’s Second Law, the force is directly proportional to acceleration.

QUESTION 2

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

ANSWER

Electric field is the region around a charge in which another charge can experience electric force. If the test charge is positive, the direction of electric field and electric force are the same. When the test charge is negative, the direction of electric force and electric field are opposite. Electric field is not a single vector quantity associated with each point in space, this is called vector field.

Magnetic field is defined as a field of force surrounding a permanent magnet or a moving charge particles, in which another permanent magnet or moving charge experiences a force compared to electric field.