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Question 1Using 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 upward.

Answer

Newton's second law states that the acceleration of an object dependens on two variables - the net force acting upon the object and the mass of the object. The acceleration of an object depends directly on the net force acting upon the object, and inversely upon the mass of the object. As the force acting on an object is increased, the acceleration of the object is increased. As the mass of an object is increased, the acceleration of the object is decreased. The vector sum of the forces F acting in the object is equal to the mass of the object multiplied by its acceleration.

Since the electron is negatively charged, it attracts to the direction of the positive terminal of the electric field. the electron will be acted on by a force that will be directed opposite to the electric field that is force would be downward direction.

F=qE.

And also, F=m \* a

Making a the subject of formulaqE=maa=(q \*E)/m

Since the electric field is uniform, therefore the magnitude and direction of the electric field will both be constant. Therefore the force and the magnitude of the acceleration will be constant while the direction of acceleration will be acting downwards.

Questions 2

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

Electric field

An electric field is said to exist at a point in space if a charged particle placed at that point experiences a force that would not be felt by an uncharged particle. A charged particle creates an electric field. The field acts on another charged object to produce a force. 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

Magnetic field

A charge that is moving in a magnetic field experiences a force perpendicular to its own velocity and to the magnetic field. Magnetic fields are produced by moving electric charges and intrinsic magnetic moments of elementary particles. A stationary charged particle does not interact with a static magnetic field. A charge placed in a magnetic field experiences a magnetic force., the charge must be moving, for no magnetic force acts on a stationary charge.

Electric current

An electric current is a stream of charged particles such as electrons or ions moving through an electrical conductor or space. Current is the rate of flow of positive charge. Current can be caused by the flow of electron, ions or other charged particles.