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DEPT: COMPUTER ENGINEERING

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.

Answer

Since the electron is negatively charged, and unlike charges attracts so that it will move to the direction of the positive terminal of the electric field.

Therefore, the electron will be acted upon by a force that will be directed opposite to the electric field i.e force is downward direction

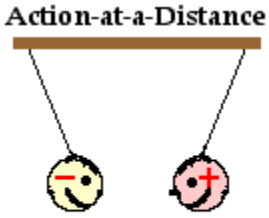
For Newton 2nd law, force =Mass x Acceleration

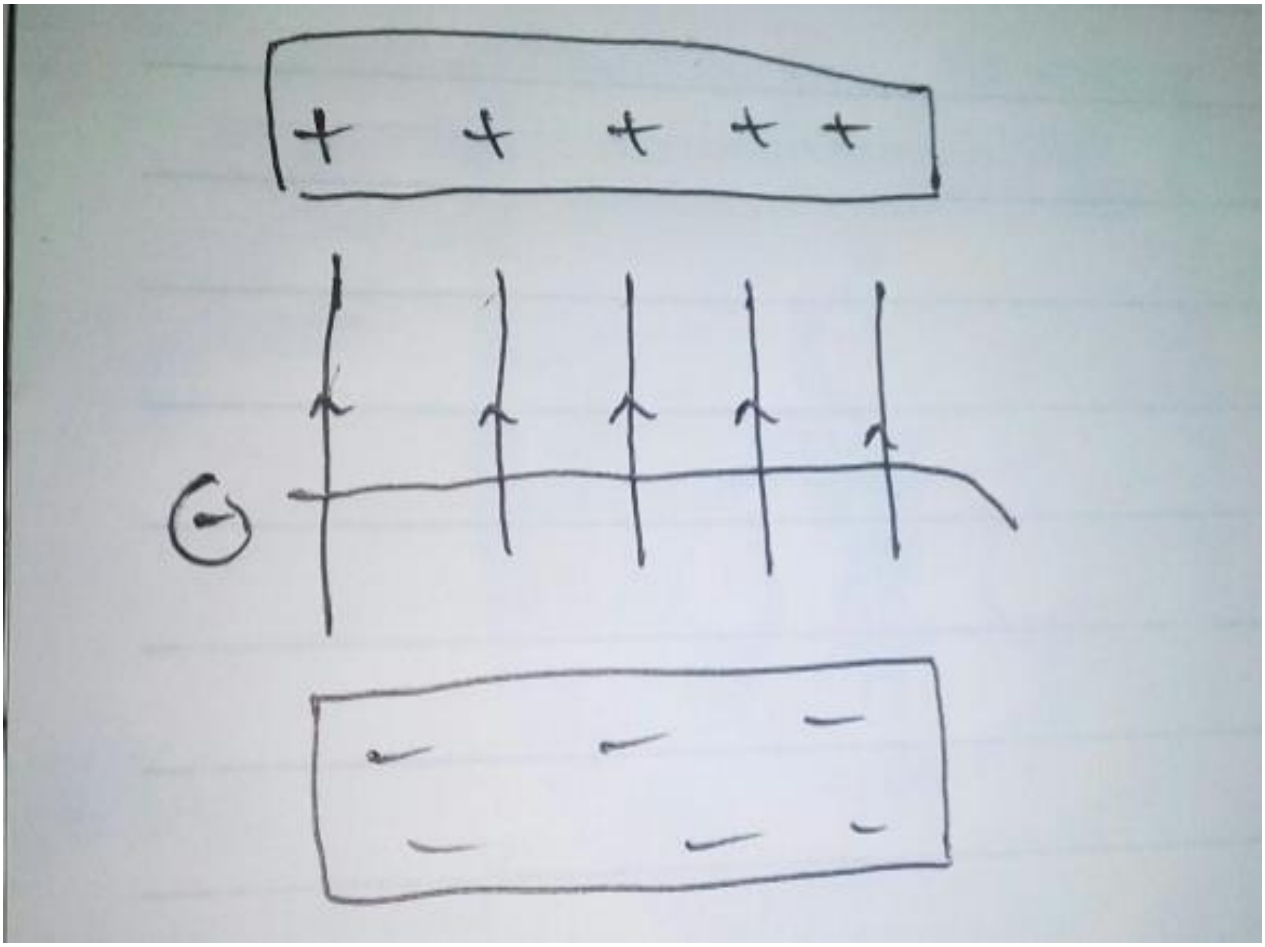
F=qE f=m x a

F=eE F=ma

Perhaps one of the most useful yet taken-for-granted accomplishments of the recent centuries is the development of electric circuits. The flow of charge through wires allows us to cook our food, light our homes, air-condition our work and living space, entertain us with movies and music and even allows us to drive to work or school safely. In this unit of The Physics Classroom, we will explore the reasons for why charge flows through wires of electric circuits and the variables that affect the rate at which it flows. The means by which moving charge delivers electrical energy to appliances in order to operate them will be discussed in detail.

One of the fundamental principles that must be understood in order to grasp electric circuits pertains to the concept of how an electric field can influence charge within a circuit as it moves from one location to another. The concept of electric field was first introduced in the unit on Static Electricity. In that unit, electric force was described as a non-contact force. A charged balloon can have an attractive effect upon an oppositely charged balloon even when they are not in contact. The electric force acts over the distance separating the two objects. Electric force is an action-at-a-distance force.





eE=ma

a=e x E/m

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 will be constant while the direction of acceleration will be downward.

Question 2

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

Electric field

An electric filed 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.

If a neutral object loses electrons, it becomes more positively charged. If a neutral object gains electrons, it becomes negatively charged. Current is the rate of flow of positive charge. Current can be caused by the flow of electron, ions or other charged particles.