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ELECT/ELECT ENGINEERING

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- 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:

Newton's second law of motion states that the acceleration of an object as produced by a net force is directly proportional to the magnitude of the net force, in the same direction as the net force and inversely proportional to the mass of the object ($\vec{F}_{net} = m\vec{a}$). In this question the two constants involves are acceleration and force. In an electric field, negative charges act in the opposite direction of the electric field. This as the electric field is acting upwards/directed upwards, as the electron is shot into the electric field, it would be directed downwards.

The electric field, thus the magnitude of the force acting upwards and that of the is equal to the magnitude of the force and acceleration acting at the electron as it moves downwards. Thus the magnitude and direction of the acceleration are constant since the electric field is uniform and since the force is constant. (Force is directly proportional to acceleration so both are constant)

Describe Electric Force Magnetic Fields and Electric Current with respect to charges.

Answer

Electric field with respect to charges.

Electric field can be defined as the region around a charged particle or object within which a force would be exerted on other charged particles or objects. It can also be defined as the electric force per unit charge. Electric field is related to electric charge with the equation $\vec{E} = \frac{\vec{F}}{q}$ (N/C)

where \vec{E} = Electric field, \vec{F} = Electric force, q = Electric charge. Now, the charge q varies at different points the value of the electric field would also vary. Also if the charge is a positive charge the direction of the force of the charge is along the electric field while that of negative would be acting against the direction of the charge is taken in consideration since the electric field is a vector and has both negative and positive directions.

Electric current with respect to charges

An electric current is a flow of electric charge in a circuit. The charges can either be negatively charged electrons or positively charged carriers like protons, positive ions or holes. Many consider the direction of the current in electric circuit is taken as the direction of positive charge flow, the direction opposite to the ~~direction of~~ actual electron drift when so defined the current is called conventional current.