

Akparanta Favour

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19/ENG061005

Mechanical Engineering

1.) Using the concept of Newton's 2nd 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.

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 object. Therefore, on entering the field, there is a vertical downward force acting on the electron. This is because electric force acts in the opposite direction as the electric field and the electric field is directed upwards.

$$F = ma \quad \text{magnitude of force is given as } F = qv$$

$$\therefore a = qv/m$$

2.) Describe Electric field and electric current with respect to charges

Electric field is the region around a charge in which the 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 is opposite. Electric field is not a single vector quantity. A magnetic field is a vector field that describes the magnetic influence on moving electric charges and electric currents. A charge that is moving in a magnetic field experiences a force perpendicular to its velocity and to magnetic field. Electric current is flow of charges given

$$\text{as } Q = It \quad \text{or } I = Q/t$$