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1.

Newton's second law states that the vector sum of the forces "F" acting on an object is equal to the mass "M" of that object multiplied by the acceleration "a" of the object: F=ma. When an electron enters the field, there is a vertical downward force acting on it. This is because electric force acts in the opposite direction to an electric field and the electric field always points upwards.

Magnitude=F= Gq

G=electric field strength, q = charge of the electron

Since no force acts horizontally, the magnitude of the acceleration is gotten by using newton's second law F=ma

Where m= mass, a= acceleration

A=f/m = G(q/m) = Gq/m

The direction of "a" is downward just like the way force F is directed. This obeys Newton's second law, force is directly proportional to acceleration.

2. ELECTRIC FIELD

An electric field is a region around a charge in which another charge can experienced electric force. The direction of the field is taken to be the direction of the field is radically outward from a positive charge and radically in toward a negative point. Electric field is not a single vector quantity but an infinite set of vector quantities, associated with each point in space, hence it is a vector field.

Electric field is represented mathematically as E=F/q

E=electric field, F=Force, q=charge

3. MAGNETIC FIELD

A magnetic field is defined as by the force that a charged particle experiences moving in this field. The magnitude of this force is proportional to the applied magnetic field. The direction of this force is perpendicular to both the direction of the moving charged particle and the direction of the applied magnetic field. Based on these observations, we define the magnetic field strength B based on the magnetic force F on a charge q moving at velocity V as the cross product of the velocity and magnetic field which is $F=qVB*Sin\theta$

Where F=magnetic force, q=charge of the particle, B= magnetic field strength, V=velocity at which the charge is moving with.

4. ELECTRIC CURRENT

Electric current is a stream of charged particles such as electrons or ions moving through an electrical conductor or space. It is measured as the net rate flow of electrical charge past a region. The moving particles are called charge carriers, which may be of several types of particles depending on the conductor