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Question 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 upward:

Newtons 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 thesame direction as the net force and inversely proportional to the mass of the object.
The magnitude and direction is simply the net force of the electron as it moves. $\therefore a = F_{net}/m$.
Therefore when the electron enters field, they will be a vertical upward force acting on it.
The magnitude of the force is given by $F = \mathcal{E}q$, where $\mathcal{E}$ is the electric field strength and q is the charge of electron.
No force acts horizontally, only vertically. Hence the magnitude of acceleration is gotten using $F = ma$

$$a = \frac{F}{m} = \frac{\mathcal{E}q}{m} \quad \therefore \quad a = \frac{\mathcal{E}q}{m}$$

This then makes the direction of acceleration (a) downward.

2. Describe Electric field, Magnetic field and Electric current with respect to Charges.

Electric field: When a charge particle with charge q at a point P is acted upon by an electric ~~field~~ force, the electric field E at that point is defined by the equation:

$$\vec{E} = f/q \quad (N/C)$$ which is force per charge.

Magnetic field: A magnetic field is a field created when a charged particle moves. It is a moving electric charge within which the force of magnetism acts. The unit of magnetic field is Tesla.

Electric Current: An electric current is a stream of charged particles, such as electrons or ions, moving through an electrical conductor or space. The S.I unit of electric current is Ampere. One ampere equals flow of electric charge across a surface at the rate of one columb per second.