

1) Since the electron is negatively charged and unlike charges attract so that it will move to the direction of the position terminal of the electric field. Therefore the electron will be directed opposite to the electric field i.e. force is downward direction for Newton's second law, force = mass \times acceleration

$$F = qE \quad F = ma$$

$$F = eE$$

$$\text{Therefore } eE = ma$$

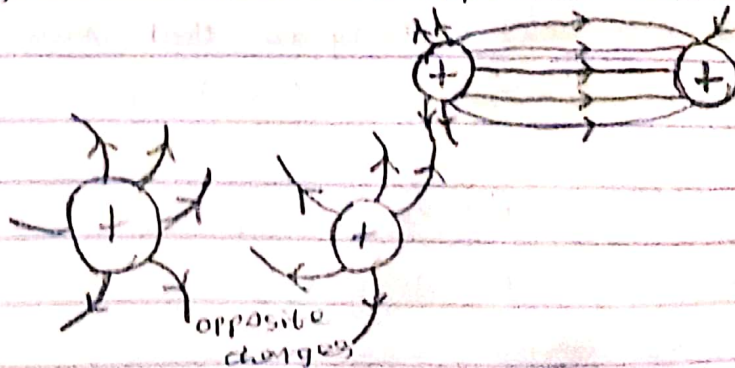
$$a = \frac{eE}{m}$$

since the electric field is uniform, therefore the electron and magnitude of the electric field will be constant. The force will be constant while the direction of the acceleration will be downward.

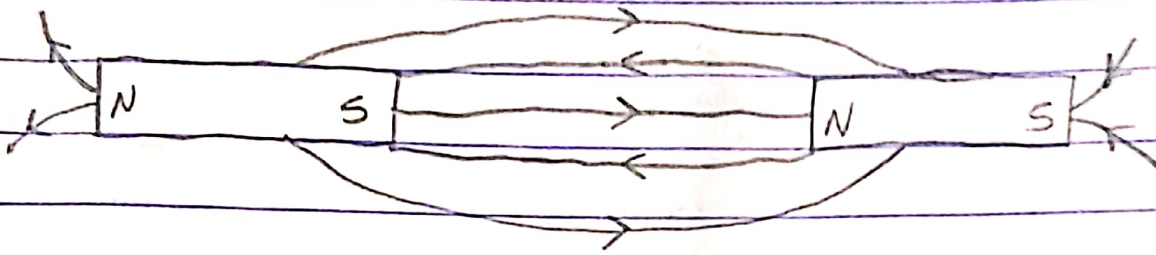
2) Electric field: An electric field is a space surrounding a charged particle where the particle exerts electric force when a charge particle with charge q at a point P is called upon an electric force F , the electric field at that point is defined as $E = \frac{F}{q}$. If a small test charge q is placed at a field point P at a distance r from source point.

magnitude of the force is given by = $\frac{Fh/q_0q}{r^2}$

The electric field is defined at each point in space as that force that would be experienced by a vanishing small positive test charge or held at that point.



b) Magnetic field: This is a vector field that describes the magnetic influence on moving electric charges, electric currents and magnetic materials. A charge that is moving in a magnetic field experience a force perpendicular to its own velocity and magnetic field. All moving particles create magnetic field and all moving charged particles can detect magnetic field resulting in a magnetic force.



Magnetic flux is the amount of magnetic field produced by a magnetic source. Magnetic flux density is the amount of flux passing through a defined area perpendicular to the direction of the flux.

$$\text{Magnetic flux density} = \frac{\text{Magnetic flux}}{\text{Area (T)}}$$

iii) Electric current: This is a stream of charged particles such as electrons or ions, moving through an electrical conductor or space. This current is the rate of movement of charge, conductors are materials that contain electrons that are loosely connected to the nucleus and can easily move through the material from the atom to another atom while insulation/insulators, electrons are held firmly to their nucleus.

$$\text{Electric current (I)} = \frac{V}{RA}$$

V - voltage

R - Resistance