Q1: part A:

Answer:

A machine multiple the efforts of human by increasing the amount of force that applied. Increasing the distance over which the is applied or changing the direction in which the force is applied. A machine makes our work easier. A machine saves our time, efforts and energy. A machine does a work in seconds that the human do in minutes or hours.

Q1: part B:

Answer:

A transformer is considered as static electrical machine because the transformer is a device which has no rotating part. All the transformer parts are static.

The motor and generator is considered as dynamic electrical machines because they have rotating parts.

Q2 part A

Answer:

Permeability

Definition: The permeability is defined as the property of the material to allow the magnetic line of force to pass through it. In other words, the magnetic material can support the development of the magnetic field. The magnetic line of force is directly proportional to the conductivity of the material. Their SI unit is Henry per meter (H/M or Hm2) or newton per ampere square (N-A2).The magnetic permeability of the material is directly proportional to the number of lines passing through it. The permeability of the air or vacuum is represented by µ0 which is equal to 4π×17-7 H/m. The permeability of air or vacuum is very poor. µ represents the magnetic permeability.

Relative Permeability –

 The relative permeability of the material is the comparison of the permeability concerning the air or vacuum. The actual permeability of the air or vacuum is very poor as compared to the absolute permeability.

The relative permeability of the material is the ratio of the permeability of any medium to the permeability of air or vacuum. It is expressed as

The relative permeability of the air and the non-magnetic material is one (u0/u0 = 1).

Q2 part B

Answer:

For find the direction of current and the direction of magnetic flux of a circular wire. we use the right hand rule. In this rule we use right hand. If we take a circular wire in our right hand straight the thumb of right hand and other four fingers are in curved. So the right hand rule states that the thumb will represent the direction of curved and the curved finger represent the direction of magnetic flux.
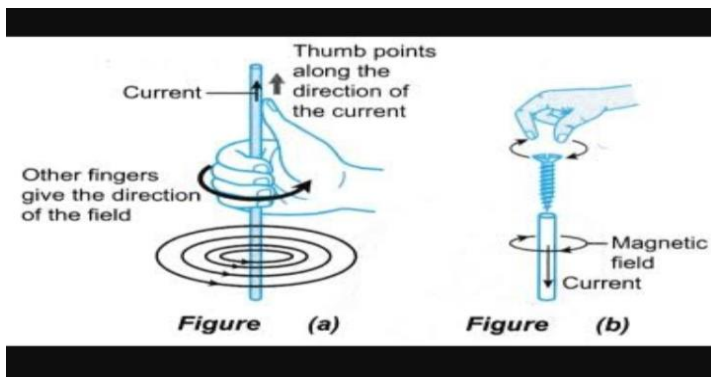
Q3 part A

Answer:

Inverse square law of magnetism:

The force of attraction or repulsion between two magnetic poles is directly proportional to the product of their pole strengths and inversely proportional to the square of the distance between them. Where mA and mB are pole strengths of two poles and r is the distance between two magnetic poles

Mathematical relation:

Force is directly proportional to the strength of magnets.

F α m1 m2

 Where F is the force and m1 and m2 are the square of distance between them.

Force is inversely proportional to the square of the distance between them.

F α $1/r^2$

Where "r" is the distance between them. Hence it is found that force F is directly proportional to $(1/r^2)$.

Q3 part B:

Answer:

A magnet is a material or object that produces a magnetic field. the magnetic field is invisible but is responsible for the most notable property of a magnet. Attraction and repulsion is a property of magnet. And the magnet is responsible for the attraction of material towards the magnet.