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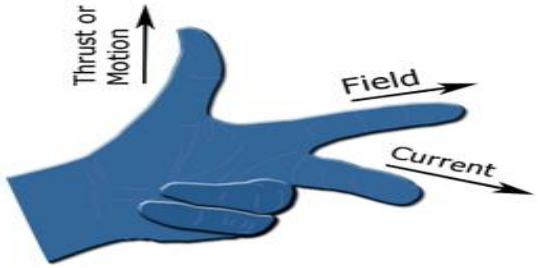
SUBJECT:- PHYSICS CLASS:- XTH DATE:- 01/07/XXI

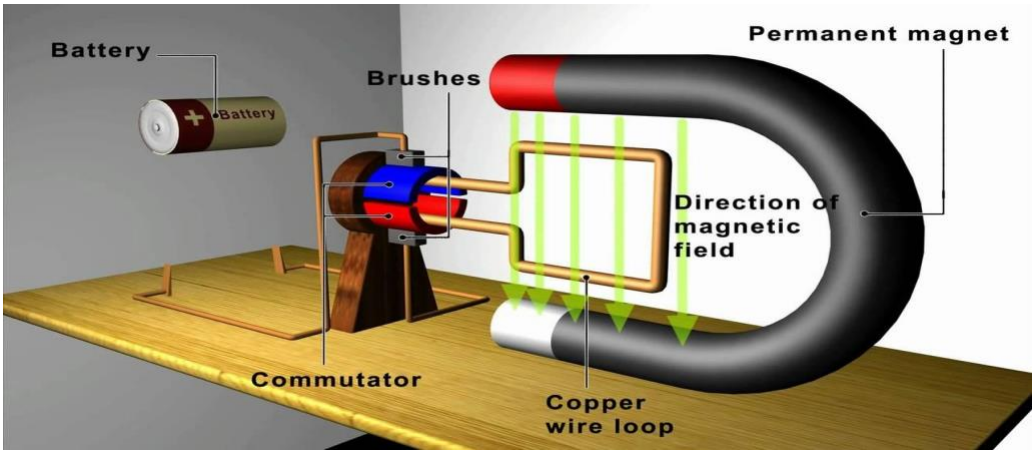
SUBJECT TEACHER:- MR. NEEL NIRANJAN

CHAPTER 2. (MAGNETIC EFFECTS OF AN ELECTRIC CURRENT) (BASED ON NCERT PATTERN)

Fleming's left hand rule:- Stretch your forefinger, centre finger & thumb mutually perpendicular to each other such that the fore finger points in the direction of the magnetic field. The centre finger indicates the direction of current & thumb gives the direction of the force of motion.



Electric motor It is a device which converts electrical energy into mechanical energy.



Principle- When a rectangular coil carrying current is placed in a magnetic field, it experiences a force that rotates it.
B1 & B2 - Brushes.

Function: To make contact with split rings. Split Rings Commutator formed by splitting of copper ring. Its function is to reverse the direction of the current.

Working of Electric Motor

Imagine a coil ABCD is in a horizontal plane such that magnetic field is parallel to the plane of the coil. When electric current is passed through coil

A and B

- In segment AB current flows from A to B. Applying Fleming's left hand rule, we come to know that it experiences force in upward direction C and D.
- In segment CD, current flows from C to D and force acts downwards (By fleming's left hand rule).
- The two forces being equal and opposite form a couple and rotate the coil in clockwise direction.
- When the coil turns an angle of 90o, commutator loses contact with brushes and thus, no force acts on the coil. But due to the momentum gained, the coil continues rotating till it covers an angle of 180o. After 180o, S1 connects with brush B2 and S2 connects with B1. This alters the direction of current in coil and new current flows in the direction BADC. This is how electric motor’s work.