

# Chapter-5

## (Dynamically Induced E.M.F)

Lecture-1

## Definition of E.M.F:

- In order to generate a dynamically induced EMF (electromotive force), **the magnetic field system must be kept stationary while the conductor is moving**. Alternately, the magnetic field system can be kept moving while the conductor is kept stationary.

## Formula of **Definition of E.M.F :**

- Electromotive force is defined as *the electric potential produced by either electrochemical cell or by changing the magnetic field*. EMF is the commonly used acronym for electromotive force.
- A generator or a battery is used for the conversion of energy from one form to another. In these devices, one terminal becomes positively charged while the other becomes negatively charged. Therefore, an electromotive force is a work done on a unit electric charge.

# Definition of E.M.F & Constrection:

## FARADAY'S LAW AND INDUCED EMF

Induced emf in conductor is:

$$\epsilon = -vBL \sin \theta$$

$$\theta = 90^\circ$$

$$\epsilon = -vBL \dots (1) \checkmark$$

Let rod moves from position 1 to 2 in time  $\Delta t$ , then

Distance covered in  $\Delta t = x_2 - x_1$

$$S = vt \Rightarrow v = S/t$$

velocity of the rod

$$= v = \frac{\Delta x}{\Delta t} \dots (2) \checkmark$$

