Chapter-7

(Inductance & Co-efficient of Coupling)

Lecture-1

What is Coupling?

- In electronics and telecommunication, coupling is the transfer of electrical energy from one circuit to another, or between parts of a circuit. Coupling can be deliberate as part of the function of the circuit, or it may be undesirable, for instance due to coupling to stray fields.

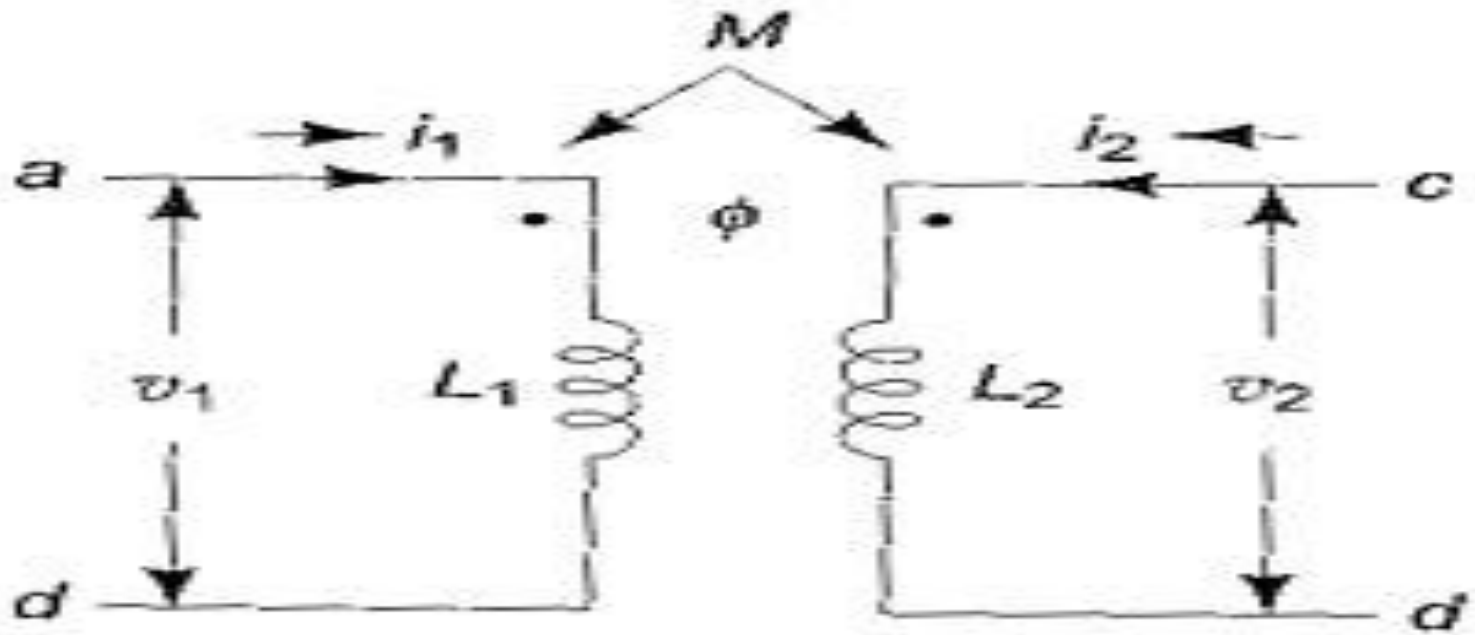

Fig. 10.10

What is Co-efficient of Coupling?

- The Coefficient of coupling can be defined as the fraction of the magnetic flux produced by the current in one coil that links with the other coil. It is represented by the symbol (k) and the amount of coupling between two inductively coupled coils is expressed in terms of the coefficient of coupling.

7-2 COUPLING COEFFICIENT, (k)

- It is measure of the magnetic coupling between two coils.
- Range of k : $0 \leq k \leq 1$
  - k = 0 means the two coils are NOT COUPLED.
  - k = 1 means the two coils are PERFECTLY COUPLED.
  - k < 0.5 means the two coils are LOOSELY COUPLED.
  - k > 0.5 means the two coils are TIGHTLY COUPLED.
- k depends on the closeness of two coils, their core, their orientation and their winding.
- The coefficient of coupling, k is given by;

$$k = \frac{M}{\sqrt{L_1 L_2}} \qquad \text{or} \qquad M = k\sqrt{L_1 L_2}$$