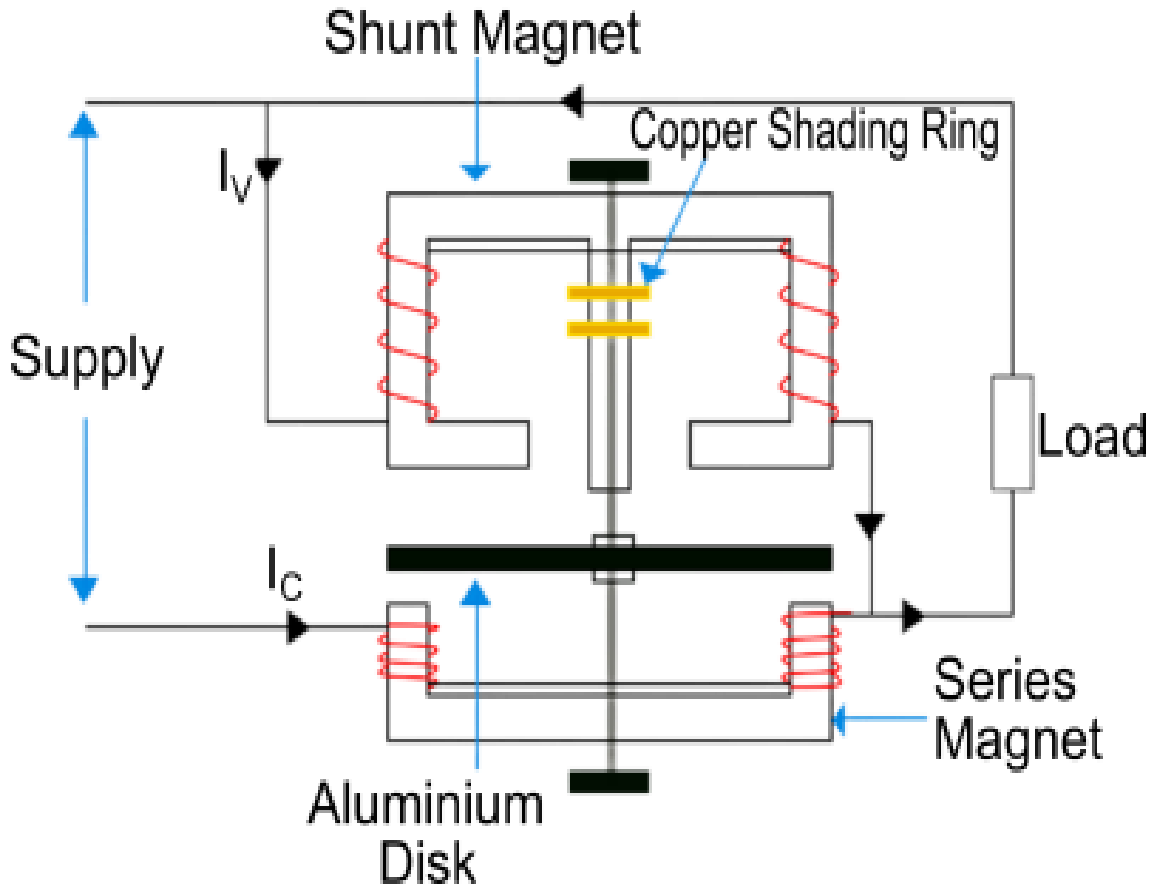
Chapter:9

(Induction Type Wattmeter)

Lecture-1

What is Induction Type Wattmeter?

- Induction type wattmeter is one of the types of wattmeter's that works on the principle of mutual induction. Since the principle of induction can only possible with alternating current. Thus induction type wattmeter's are used for the measurement of power only in ac circuits. Compared to electrodynamometer type wattmeters where it can be used in both ac and dc circuits, induction type wattmeters can be used only in the circuits having relatively steady values of frequency and voltage


Shunt Magnet
Copper Shading Ring
I_V
Supply
Load
I_C
Series
Magnet
Aluminium
Disk

Construction of Induction Type Wattmeter :

- It mainly consists of two laminated electromagnets wound with conductors known as shunt and series magnets. The upper electromagnet is known as a shunt magnet. It consists of three limbs, the side limbs carry the winding and it is connected across the load. These windings are excited by the current proportional to the voltage across the load, hence they are called voltage coils.
- The lower electromagnet is connected in series with load in which power is to be measured and is known as a series magnet. It carries the windings called current coils and it is excited proportionally to the load current. The below shows the construction of an induction-type wattmeter.

Principles of Operation of Induction Type Wattmeter:

- The induction type wattmeter can be used to measure AC power only.
- The working of induction type wattmeter is based on the principle of electromagnetic induction.
- The induction wattmeter consists of two laminated electromagnets viz. Shunt Magnet and Series Magnet. The shunt magnet is connected across the supply and carries a current proportional to the supply voltage. The coil of shunt magnet is made highly inductive so that the current in it lags the supply voltage by 90°. The series magnet is connected in series with the supply and carries the load current. The coil of series magnet is made highly noninductive. A thin disc (made up of aluminium) mounted on a spindle is placed between the two magnets so that it cuts the flux of the two magnets.