SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 23EEB204 ELECTRICAL MACHINES AND POWER SYSTEMS

II YEAR /III SEMESTER

Unit 2- TRANSFORMERS

Topic : Load Test & Regulation of Single Phase Transformer

Transformer Load Test

➢A load test is performed in the laboratory to check its performance before it is actually used on site.

➢For getting the values of regulation & efficiency at different power factor, the different types of loads that is inductive or capacitive load should be used
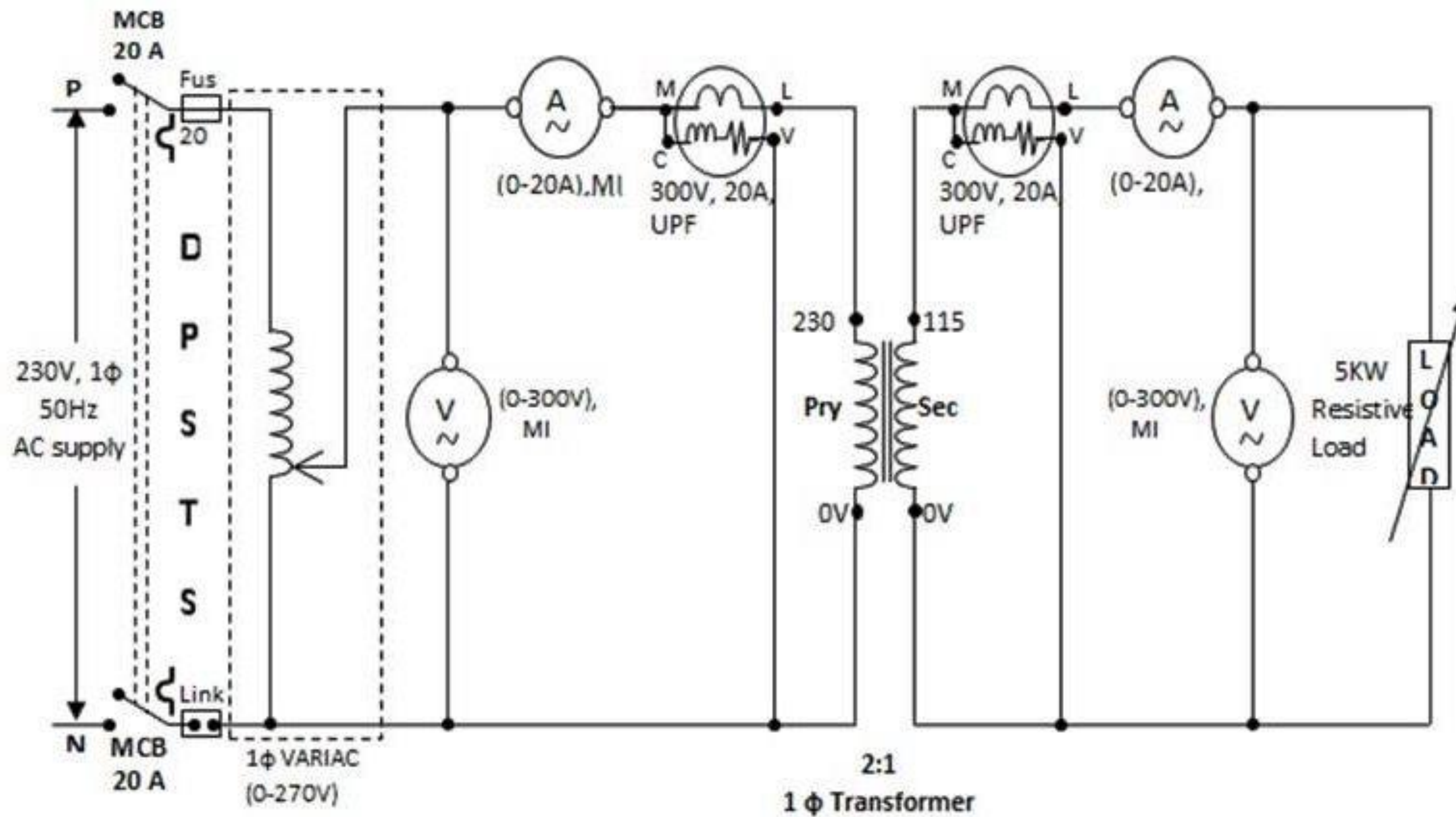
- Connections are given as per the circuit diagram

- The DPST switch on the primary side is closed

- The voltmeters and ammeters readings are noted and tabulated at no load condition

- The transformer is loaded upto 130% of the rated load, corresponding ammeters, Voltmeters and watt meters readings are noted and tabulated.

- After the observation of all the readings the load is released gradually to its initial position

- The supply is switched off

Characteristics
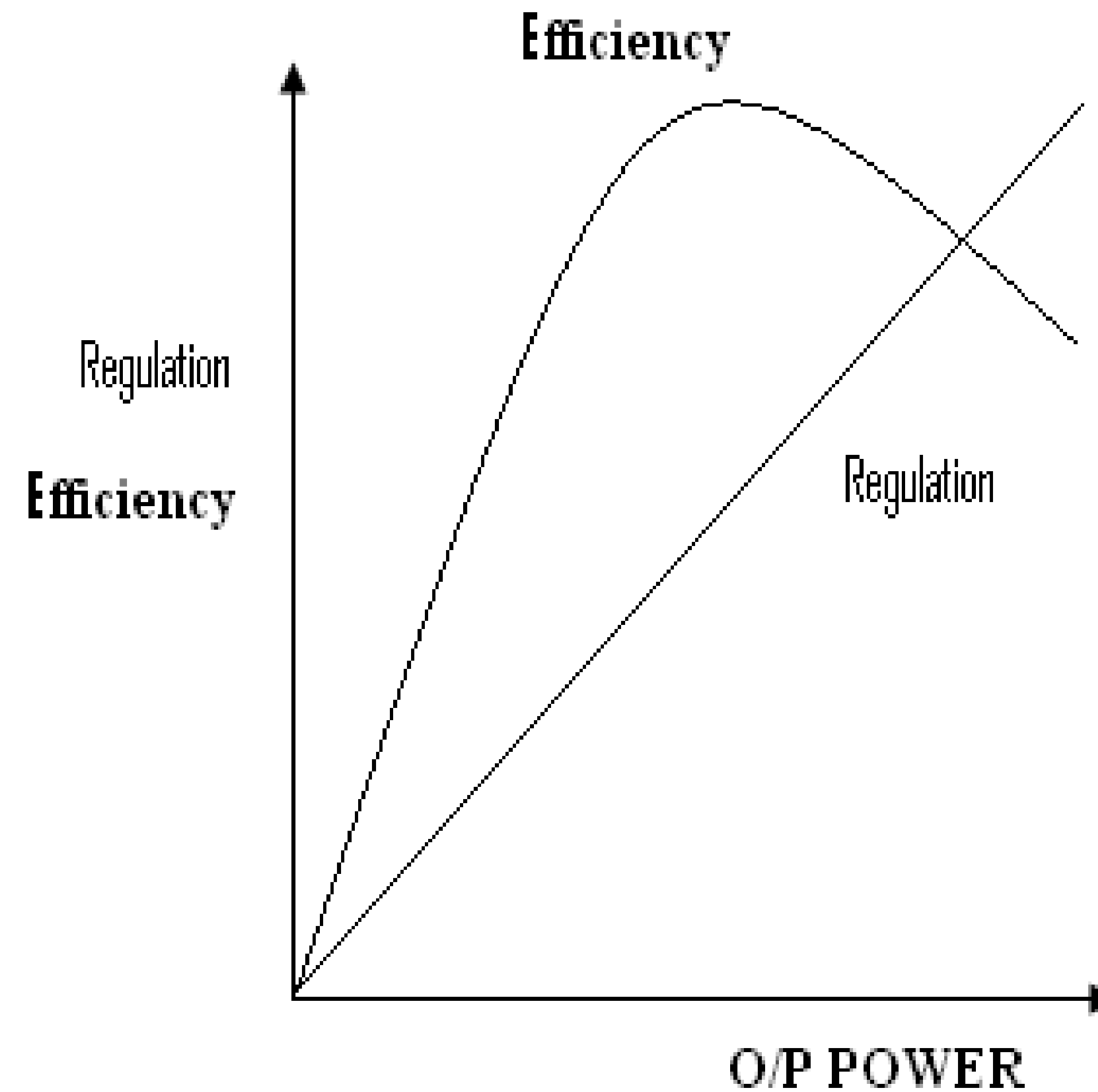
Voltage Regulation

- **Voltage Regulation** of single-phase transformers is the percentage (or per unit value) change in its secondary terminal voltage compared to its original no-load voltage under varying secondary load conditions.

- When there is no-load connected to the transformers secondary winding, that is its output terminals are open-circuited, there is no closed-loop condition, so there is no output load current ($I_L = 0$) and the transformer acts as one single winding of high self-inductance.

- Note that the no-load secondary voltage is a result of the fixed primary voltage and the turns ratio of the transformer.

➤ Loading the secondary winding with a simple load impedance causes a secondary current to flow, at any power factor, through the internal winding of the transformer.

➤ Thus voltage drops due to the windings internal resistance and its leakage reactance causes the output terminal voltage to change.

➤ A transformers voltage regulation change between its secondary terminal voltage from a no-load condition when $I_L = 0$, (open circuit) to a fully-loaded condition when $I_L = I_{MAX}$ (maximum current) for a constant primary voltage is given as:

➤ $$\text{Regulation} = \frac{\text{Change in Actual Output Voltage}}{\text{The No-load Output Voltage}}$$

$$\therefore \text{Regulation} = \frac{V_{(no\text{-}load)} - V_{(full\text{-}load)}}{V_{(no\text{-}load)}}$$

1. **The Field coils of the DC generator are made up of ----?**
 (A) Steel
(B) Copper
(C) Aluminum
(D) Iron

2. **The insulating material used between the commutator segments is normally**
(A) Graphite
(B) Paper
(C) Mica
(D) Insulating varnish

References

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Thank You