
Course Details

Subject Code	18EEL37	CIE Marks	40
Number of Practical Hours/ Week	03	SEE Marks	60
Total Number of Practical Hours	42	Exam Hours	03
Core/ Professional or Open Elective	Laboratory	Credits	02
Course Owner	Prof. Jagadeeshwar G S		

List of Experiments

Sl No	Experiments
1	Open Circuit and Short circuit tests on single phase step up or step down transformer and predetermination of (i) Efficiency and regulation (ii) Calculation of parameters of equivalent circuit.
2	Sumpner's test on similar transformers and determination of combined and individual transformer efficiency.
3	Parallel operation of two dissimilar single-phase transformers of different kVA and determination of load sharing and analytical verification given the Short circuit test data.
4	Polarity test and connection of 3 single-phase transformers in star – delta and determination of efficiency and regulation under balanced resistive load.
5	Comparison of performance of 3 single-phase transformers in delta – delta and V – V (open delta) connection under load.
6	Scott connection with balanced and unbalanced loads.
7	Separation of hysteresis and eddy current losses in single phase transformer.
8	Voltage regulation of an alternator by EMF and MMF methods.
9	Voltage regulation of an alternator by ZPF method.
10	Power angle curve of synchronous generator or Direct load test on three phase synchronous generator to determine efficiency and regulation
11	Slip test – Measurement of direct and quadrature axis reactance and predetermination of regulation of salient pole synchronous machines.
12	Performance of synchronous generator connected to infinite bus, under constant power and variable excitation & vice - versa.

Laboratory Plan and Delivery

Batches	B1		B2		B3	
Experiment Number	Planned Date	Engaged Date	Planned Date	Engaged Date	Planned Date	Engaged Date
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Lab Course Assessment Tools and Attainments

Assessment Tools	CO Attainment
CIE	
Internal Assessment Test	
Course End Survey	
End Exam Survey	

Mapping of CO-PO with Experiments

All the experiments are to defined through 3 Cos in subject related*

CO	18EEL37: Electrical Machines Laboratory-I	Experiments Number	PO's (RBT)	Domain
18EEL37.1	Evaluate the performance of transformers and synchronous generators	1,2,3,4,5,7,8, 9,10	4	Cognitive or Knowledge Domain
18EEL37.2	Assess the performance of single phase transformers for three phase operation and phase conversion	6	4	Cognitive or Knowledge Domain
18EEL37.3	Assess the performance of synchronous generator connected to infinite bus.	11	4	Cognitive or Knowledge Domain
18EEL37.4	Committed to professional ethics, self-learning, punctual and confident.	All	8, 9 (P3)	Psychomotor or Skill Domain
18EEL37.5	Neat representation of the experiment in oral and written form.	All	10 (A5)	Affective or Attitude Domain

RBT - Revised Bloom's Taxonomy (Cognitive or Knowledge Domain)

I. Remembering	II. Understanding	III. Applying
IV. Analyzing	V. Evaluating	VI. Creating

RBT - Revised Bloom's Taxonomy (Psychomotor or Skill Domain)

I. Perceiving	II. Patterning	III. Accommodating	VII. Composing
IV. Refining	V. Varying	VI. Improvising	

RBT - Revised Bloom's Taxonomy (Affective or Attitude Domain)

I. Receiving	II. Responding	III. Valuing
IV. Organization	V. Characterization	

Viva Questions
Electrical Machines Laboratory-I (17EEL37)

1. What is the basic principle of operation of a single phase transformer?
2. What are the losses in a transformer?
3. Why the efficiency of the transformer is higher than the rotating machines?
4. At full load, Copper loss =80 watt & iron loss = 30 watt. What will be the values of copper loss & iron loss at half full load.
5. What is regulation of a transformer?
6. For a good transformer regulation should be low or high.

7. What information you will get by conducting OC & SC test?
8. What do you mean by predetermination of efficiency & regulation of a transformer?
9. What happens if the primary of the transformer is excited by a DC source?
10. What is the condition for maximum efficiency?
11. What are the conditions to be satisfied for parallel operation of single phase transformers?
12. What is the necessity of paralleling transformers?
13. How 2 transformers share the common load?
14. What is meant by circulating current with respect to parallel operation of transformers?
15. Why Sumpner's test is also called as 'back to back test'?
16. Why does this test need two identical transformers?
17. What information you will get by conducting this test?
18. What is the advantage of this test?
19. What are the limitations of this test?
20. Distinguish between commercial efficiency & all day efficiency.
21. What are the sources of heat in a power transformer?
22. Why the transformer core is laminated give reasons?
23. How does Hysteresis loss & eddy current loss take place in a magnetic material?
24. How 2-Phase supply can be obtained from 3-Phase supply?
25. How many transformers are used in Scott connection? Name them.
26. Draw the vector diagram for Scott connection.
27. Distinguish between an auto-transformer & a 2 winding transformer?