

Wks Mapped with the course

WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9
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Course Assessment Method (CIE: 50 marks, ESE: 50 marks)

Total Marks	CIE Marks	ESE Marks	ESE Duration
100	50	50	3 Hours

Attendance	Preparation / Pre-Lab Work, Viva and Timely completion of Lab Reports / Record	Internal Examination	Total
5	25	20	50

Procedure / Preparatory Work / Design / Algorithm	Conduct of Experiment / Execution / Troubleshooting	Result with Valid Inference / Quality of Output	Viva Voce	Record	Total
10	15	10	10	5	50

Submission of Record: Students shall be allowed for the end semester examination only upon submitting the duly certified record.

Endorsement by External Examiner: The external examiner shall endorse the record.

Continuous Assessment (25 Marks)**1. Conduct of Experiments (10 Marks)**

- Procedure and Execution
- Skill Proficiency
- Teamwork

2. Lab Reports and Record Keeping (5 Marks)

- Quality of Reports
- Timely Submission

3. Viva Voce (10 Marks)

- Ability to explain experiments and underlying principles

Final Marks Averaging: The final marks are the average of experiments conducted in the lab.

Evaluation Pattern for End Semester Examination (50 Marks)

1. Procedure / Preliminary Work / Design / Algorithm (10 Marks)
2. Conduct of Experiment / Execution of Work (15 Marks)
3. Result with Valid Inference / Quality of Output (10 Marks)
4. Viva Voce (10 Marks)
5. Record (5 Marks)

Expt. No.	EXPERIMENTS
	PART A – DC MACHINES
1	Open circuit characteristics of DC shunt generator (CO1) Objectives: a. Predetermine the OCC at different speeds b. Determine the critical field resistance c. Determine the maximum voltage built up with given shunt field resistance d. Determine the critical speed for a given shunt field resistance

Text Books

2	Load test on DC shunt generator (CO1) Objectives: Determine the external and internal characteristics
3	Brake test on DC shunt motor (CO2) Objectives: Plot the following characteristics: - Performance characteristics - Electrical characteristics - Mechanical characteristics
4	Brake test on DC series motor (CO2) Objectives: Plot the following characteristics: - Performance characteristics - Electrical characteristics - Mechanical characteristics
5	Load test on DC compound generator (CO1) Objectives: - Plot the load characteristics when cumulatively compounded - Plot the load characteristics when differentially compounded
6	Hopkinson's test on DC shunt machine (CO3) Objectives: - Predetermine the efficiency while DC machine is acting as generator and motor - Plot the efficiency curves while DC machine is acting as generator and motor
7	Hopkinson's test on a pair of DC machines (CO3) Objectives: Determine the efficiency of the DC machine while working as a motor and generator under various load conditions
8	Retardation test on a DC machine (CO3) Objectives: - Separate the hysteresis, eddy current, friction and windage losses - Find the moment of inertia of the rotating system
9	Separation of losses in a DC shunt motor (CO3) Objectives: Separate the hysteresis, eddy current, friction and windage losses by conducting no-load tests at different excitations
PART B – TRANSFORMERS	
10	OC and SC tests on single-phase transformer (CO4) Objectives: - Predetermine the voltage regulation and efficiency at different loads and power factors - Determine the equivalent circuit referred to LV side and HV side - Plot the voltage regulation vs power factor curves at full-load and half full-load - Plot the efficiency curve at unity p.f. and 0.5 p.f. - Determine the power factor at which the voltage regulation is zero - Determine the load at which maximum efficiency occurs and the maximum efficiency

Text Books

11	Load test on single-phase transformer (CO4) Objectives: Determine the voltage regulation and efficiency at different loads and at unity power factor
12	Separation of losses in a single-phase transformer (CO4) Objectives: a. Separate the hysteresis and eddy current losses using voltage and frequency control b. Plot losses Vs frequency curves at normal voltage and different frequencies c. Plot losses Vs frequency curves at different frequencies keeping V/f constant
13	Efficiency and regulation test on single-phase transformer (CO4) Objectives: a. Predetermine voltage regulation and efficiency at different loads and power factors b. Determine the equivalent circuit referred to LV and HV side
14	Parallel operation of two dissimilar single-phase transformers (CO4) Objectives: a. Determine the load sharing while operating in parallel b. Verify the load sharing using transformer impedances
15	OC and SC tests on three-phase transformer (CO5) Objectives: a. Predetermine voltage regulation and efficiency at different loads and power factors b. Determine the per phase equivalent circuit
16	Scott connection (CO4) Objectives: Convert 3-phase AC supply into 2-phase AC and conduct load test to study performance
NOTE: A minimum of TWELVE experiments are mandatory out of the sixteen listed.	

Text Books

1. Bimbira, P. S. (2011). *Electrical machinery* (7th ed.). Khanna Publishers.
2. Theraja, B. L. (2005). *A textbook of electrical technology*. S. Chand & Company.
3. Kothari, D. P., & Nagrath, I. J. (2017). *Electric machines* (5th ed.). Tata McGraw-Hill.

Reference Books

1. Say, M. G. (2002). *The performance and design of AC machines* (3rd ed.). CBS Publishers.
2. Langsdorf, A. S. (2001). *Theory of alternating current machinery* (2nd rev. ed.). Tata McGraw-Hill.

