II Year I Semester	**L**	**T**	**P**	**C**
Code: 20EC3103	**0**	**0**	**3**	**1.5**

ELECTRICAL TECHNOLOGY AND NETWORK ANALYSIS LABORATORY

Preamble: Electric Machines and Network Analysis Laboratory provides the essential facilities to the students to augment their concepts about the fundamentals of Electric Circuits, AC and DC Machines. The lab is equipped with DC Shunt Machines, AC Induction Motor, Single-phase transformers and Basic Electric circuit components. This laboratory is equipped with various tests and monitoring equipment also.

Course Objectives

1. To plot Characteristics and access the performance of DC Shunt Machines by different tests
2. To plot Characteristics and access the performance of Transformer by suitable tests
3. Select appropriate network theorems to analyze electric circuits
4. Evaluate the frequency response of electric networks

Course Outcomes

1. Analyze the performance of a given DC machines under different load conditions
2. Apply the testing procedures for a given DC machine
3. Test the performance and find the parameters of the given transformer
4. To understand the applications of network theorems for analysis of electrical networks
5. To understand the behaviour of RLC networks for sinusoidal excitations

CO – PO & CO – PSO Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	P01 0	PO1 1	P01 2	PSO 1	PSO 2	PSO 3
CO 1	3	3	2												
CO 2	3	3	2												
CO 3	3	3	2												
CO 4	3	3	2												

1 – Weak, 2 – Moderate & 3 - Strong

Detailed Syllabus

Part-A: Compulsory Experiments

1. Speed control of DC Shunt Motor by Armature Control Method.
2. Speed control of DC Shunt Motor by Field Flux weakening Method.
3. Magnetization characteristics of DC Shunt Generator. Determination of critical field resistance and critical speed
4. Brake test on DC Shunt Motor. Determination of Performance Characteristics.

5. Brake Test on Three Phase Squirrel Cage Induction Motor
6. Verification of Superposition theorem and Reciprocity Theorems.
7. Verification of Thevenin's and Norton's Theorems
8. Verification of Maximum Power Transfer Theorem and Millman's Theorem
9. OC & SC Tests on Single Phase Two winding Transformer. Predetermination of Efficiency
10. Determination of Z and Y parameters

Part-B: Additional Experiments:

1. Series and parallel resonance
2. Measurement of active power, power factor and reactive power of a 1-Ø RLC circuit.

Text Books:

1. Electrical Machinery by Dr. P.S. Bhimbra, Khanna Publishers
2. A Text Book of Electrical Technology, Volume-II, AC and DC Machines by B.L. Theraja and A.K.Theraja. S.Chand Publications
3. Charles K. Alexander and Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", 5th Edition, Tata McGraw Hill Publications, 2012

Reference Books:

1. Laboratory Manual for Electrical Machines by D.P .Kotari and BS Umre, I K International Publishing House Pvt. Ltd.
2. M.E. Van Valkenburg, "Network Analysis", Prentice Hall of India Pvt Ltd.,3rd Edition, New Delhi. 2. Hayt and Kemmerly, "Engineering Circuit Analysis", Tata Mc Graw Hill Publications, 7th Edition, 2007