II B.Tech – I Semester
(20EE3102) DC MACHINES AND TRANSFORMERS LABORATORY

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
15	35	50	-	-	3	1.5

Pre-Requisites: DC Machines and Transformers

Course Objectives:

- To enable, train and evaluate the ability of the students to perform the analysis of any electromechanical energy conversion system
- To empower students to determine the parameters of DC machines and transformers by performing experiments.
- To enable students to identify and solve DC machine and Transformer related problems
- The ability to select a suitable measuring instrument for a given application.

S. No	List of Experiments (Compulsory)
1.	Speed control of DC Shunt Motor by Armature Control and Field Flux weakening Methods.
2.	Swinburne's Test on a DC Shunt Machine and Predetermination of efficiencies as Generator and Motor.
3.	Magnetization characteristics of DC Shunt Generator. Determination of critical field resistance and critical speed.
4.	Load Test on DC Series Generator. Determination of Load Characteristics.
5.	Load Test on DC Shunt Generator. Determination of Load Characteristics
6.	Brake test on DC Shunt Motor. Determination of Performance Characteristics.
7.	Brake test on DC Compound Motor. Determination of Performance Characteristics.
8.	Hopkinson's Test on Identical Two DC Shunts Machines. Predetermination of Efficiency.
9.	Separation of Core Losses Test on a DC Shunt Machine.
10.	OC & SC Tests on Single Phase Two winding Transformer. Predetermination of Efficiency and Voltage Regulation.
11.	Sumpner's test on single phase transformer. Predetermination of Efficiency and Voltage Regulation of individual Transformer.
12.	Parallel Operation of Two Single Phase Two winding Transformers. Determination of Efficiency and Voltage Regulation with Resistance Load Bank.

S. No	List of Experiments (Optional)
1.	Scott-T connection of Main and Teaser transformers to convert Three Phase to Two-Phase Supply.
2.	Load Test on DC Compound Generator. Determination of Load Characteristics.

Course Outcomes:

After successful completion of the course, the students will be able to:

S.No	Course Outcome	BTL
1.	Student will be able to acquire hands on experience of conducting various tests on DC Machines and Transformers	L3
2.	Student will be able to compute losses and Efficiency of DCMachines at different load conditions.	L2
3.	Student will be able to compute losses, Efficiency and Voltage Regulation of Transformers at different load conditions and power factors.	L2
4.	Student will be able to verify the characteristics of DC Machines and Transformers and predict specific applications of those machines accordingly	L6
5.	Student will be able to acquire hands on experience to obtain Two Single Phase power supply from a Three-Phase Power Supply by using Scott-T connection between Main and Teaser Transformers with 86.6% Tapping.	L3

Correlation of COs with POs& PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	2	2	-	-	-	-	1	1	-	-	2	-
CO2	1	1	2	2	-	-	-	-	1	1	-	-	2	-
CO3	1	1	2	2	-	-	-	-	1	1	-	-	2	-
CO4	1	1	2	2	-	-	-	-	1	1	-	-	2	-
CO5	-	-	2	2	-	-	-	-	1	1	-	-	2	-

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

Reference Books:

1. Laboratory Manual for Electrical Machines by D.P .Kotari and BS Umre, I K International Publishing House Pvt. Ltd.
2. Laboratory Manual for DC Machines and Transformers prepared by Department of Electrical and Electronics Engineering, Raghu Engineering College (Autonomous).