	AC MACHINES LAB	Category	L	T	P	Credit
22EE480		PCC	0	0	2	1

Preamble

This laboratory gives a practical exposure to the students to fundamental concepts regarding AC Machines that are currently used in Electrical Systems. The students also learn to select the suitable AC Electrical Machines for an application based on its characteristics, perform suitable capacitor additions to improve power factor and to familiarize the standard testing procedures of AC Machines. The students can also perform evaluation of efficiency improvement by switching over to Adjustable speed drives.

Prerequisite

22EE320   DC Machines and Transformers

Course Outcomes

On the successful completion of the course students will be able to

CO Number	Course Outcome Statement	Weightage*** in %
CO1	Predetermination of efficiency of three phase Induction Motor	20
CO2	Obtain the performance characteristics of Induction Motor (Squirrel Cage, Slip ring, Single Phase)	20
CO3	Obtain the characteristics of Synchronous Motor	10
CO4	Obtain the voltage regulation of AC Generator (Salient Pole & Cylindrical Rotor type) by direct loading	20
CO5	Obtain the voltage regulation of AC Generators by indirect methods (EMF, MMF and ZPF) and by slip test.	20
CO6	Demonstrate experimentally synchronisation of alternator with busbar and the generator action of induction machine	10

*** Weightage depends on Bloom's Level, number of contact hours,

Mapping with Programme Outcomes and Programme Specific Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	S	M	L	L		M	M	M	S	M			S		
CO2	S	M	L	L				M	S	M			S		

CO3	S	M	L	L				M	S	M			S		
CO4	S	M	L	L				M	S	M			S		
CO5	S	M	L	L		M	M	M	S	M			S		
CO6	M	L				M	S	M	S	M			M		

S- Strong; M-Medium; L-Low

Assessment Pattern: Cognitive Domain

Cognitive Levels	Model Examination	Terminal Examination
Remember		
Understand	10	10
Apply	40	40
Analyse	20	20
Evaluate		
Create		

Assessment Pattern: Psychomotor

Psychomotor Skill	Miniproject/Practical Component/Observation
Perception	
Set	
Guided Response	
Mechanism	30
Complex Overt Responses	
Adaptation	
Origination	

List of Experiments/Activities with CO Mapping

E.No	Name of the experiment	CO	No. of sessions
Three Phase Induction Motor			
1.	Predetermination of Three-Phase Induction Motor efficiency using circuit model and circle diagram	CO1	1
2.	Performance Characteristics of Three-Phase Induction Motor by actual loading (squirrel cage, slip ring)	CO2	1
3.	Speed control of Three-Phase Induction Motor with VFD	CO2	1
Single Phase Induction Motor			
4.	Performance Characteristics of Single-Phase Induction Motor by actual loading	CO2	1
Synchronous Machines			
5.	V and inverted V curves of Synchronous Motor	CO3	1
6.	Voltage Regulation Characteristics of Alternators by direct load test	CO4	1
7.	Voltage Regulation characteristics of cylindrical rotor Alternator by indirect methods	CO5	1
8.	Slip test on Salient Pole Synchronous generator	CO5	1
9.	Synchronization of Alternators	CO6	1
Induction Generator			
10.	Load Characteristics of Induction Generator	CO6	1

Reference Books

1. H.Wayne Beaty & Jame. L.Kirtley.Jr " Electric Motor Handbook", McGraw-Hill, USA, 1st Edition, 1998.
2. A.K.Sawhney and A.Chakrabarti, "A course in Electrical Machine Design",6th Edition, Dhanpat Rai & Co (P) Ltd., 2006.
3. Gupta.J.B,"Theory of Performances of Electrical Machines' Katson, 7th Edition, 1987

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