

Lesson Plan

Name of Faculty :- **Jaipal**
Discipline :- **Electrical Engineering**
Semester :- **Fourth Semester**
Subject :- **Electrical Machine -I**

Lesson Plan Duration:- 15 Week

Week	Theory		Practical	
	Lecture Day	Topic	Practical Day	Topic
1 st	1 st	Unit-1 Introduction to Electrical Machines Definition of motor and generator, concept of torque	1 st	PRACTICAL-1 Measurement of the angular displacement of the rotor of a slip-ring induction motor on application of DC to stator of motor winding in sequence and simultaneously to each phase of rotor winding
	2 nd	Torque development due to alignment of two fields and the concept of torque angle		
	3 rd	Electro-magnetically induced emf	2 nd	PRACTICAL-1 Measurement of the angular displacement of the rotor of a slip-ring induction motor on application of DC to stator of motor winding in sequence and simultaneously to each phase of rotor winding
	4 th	Elementary concept of an electrical machine		
2 nd	5 th	Comparison of generator and motor	3 rd	PRACTICAL-2 Speed control of dc shunt motor (i) Armature control method (ii) Field control method
	6 th	REVISION UNIT-1		
	7 th	REVISION UNIT-1	4 th	PRACTICAL-2 Speed control of dc shunt motor (i) Armature control method (ii) Field control method
	8 th	REVISION UNIT-1		

3rd	9th	Unit-2 DC Machines Main constructional features, Types of armature winding	5th	PRACTICAL-3 Study of dc series motor with starter (to operate the motor on no load for a moment)
	10th	Function of the commutator for motoring and generation action		
	11th	Factors determining induced emf	6th	PRACTICAL-3 Study of dc series motor with starter (to operate the motor on no load for a moment)
	12th	Factors determining the electromagnetic torque		
4th	13th	Types of dc generation on the basis of excitation, voltage built up in a dc shunt generator	7th	PRACTICAL-4 Study of 3 point starter for starting D.C. shunt motor.
	14th	Significance of back e.m.f., the relation between back emf and Terminal voltage		
	15th	Armature Reaction	8th	PRACTICAL-4 Study of 3 point starter for starting D.C. shunt motor.
	16th	Commutation methods to improve commutation		
5th	17th	Performance and characteristics of different types of DC motors	9th	PRACTICAL-5 To perform open circuit and short circuit test for determining: (i) equivalent circuit (ii) the regulation and (iii) efficiency of a transformer from the data obtained from open circuit and short circuit test at full load
	18th	Speed control of dc shunt/series motors		
	19th	Need of starter, three point dc shunt motor starter and 4-point starter	10th	PRACTICAL-5 To perform open circuit and short circuit test for determining: (i) equivalent circuit (ii) the regulation and (iii) efficiency of a transformer from the data obtained from open circuit and short circuit test at full load
	20th	Applications of DC motors		
6th	21st	Losses in a DC machine	11th	PRACTICAL-6 To find the efficiency and regulation of single phase transformer by actually loading it.
	22nd	Determination of losses by Swinburne's test		
	23rd	REVISION UNIT-2		PRACTICAL-6

	24 th	REVISION UNIT-2	12 th	To find the efficiency and regulation of single phase transformer by actually loading it.
7 th	25 th	REVISION UNIT-2	13 th	PRACTICAL-7 Checking the polarity of the windings of a three phase transformer and connecting the windings in various configurations
	26 th	REVISION UNIT-2		
	27 th	REVISION UNIT-2	14 th	PRACTICAL-7 Checking the polarity of the windings of a three phase transformer and connecting the windings in various configurations
	28 th	REVISION UNIT-2		
8 th	29 th	Unit-3 Transformers(Single phase) Introduction	15 th	PRACTICAL-8 Finding the voltage and current relationships of primary and secondary of a three phase transformer under balanced load in various configurations conditions such as Star-star Star delta Delta star Delta - Delta configuring conditions
	30 th	Constructional features of a transformer and parts of transformer		
	31 st	Working principle of a transformer	16 th	PRACTICAL-8 Finding the voltage and current relationships of primary and secondary of a three phase transformer under balanced load in various configurations conditions such as Star-star Star delta Delta star Delta - Delta configuring conditions
	32 nd	EMF equation		
9 th	33 rd	Transformer on no-load and its phasor diagram	17 th	REVISION PRACTICAL-1
	34 th	Transformer – neglecting voltage drop in the windings – Ampere turn balance – its phasor diagram		
	35 th	Mutual and leakage fluxes, leakage reactance	18 th	REVISION PRACTICAL-1
	36 th	Transformer on load, voltage drops and its phasor diagram		
	37 th	Equivalent circuit	19 th	REVISION PRACTICAL-2
	38 th	Relation between induced emf and terminal voltage, regulation of a transformer-mathematical relation		

10th				
	39th	Losses in a transformer	20th	REVISION PRACTICAL-2
40th	Open circuit and short circuit test. Calculation of efficiency, condition for maximum efficiency-maintenance of Transformer, scheduled Maintenance			
11th	41st	Auto transformer construction, saving of copper, working and applications	21st	REVISION PRACTICAL-3
	42nd	Different types of transformers including dry type transformer		
	43rd	REVISION UNIT-3	22nd	REVISION PRACTICAL-3
	44th	REVISION UNIT-3		
12th	45th	REVISION UNIT-3	23th	REVISION PRACTICAL-4
	46th	REVISION UNIT-3		
	47th	REVISION UNIT-3	24th	REVISION PRACTICAL-4
	48th	REVISION UNIT-3		
13th	49th	Unit-4 Transformers three phase Construction of three phase transformers	25th	REVISION PRACTICAL-5
	50th	And accessories of transformers such as Conservator, breather(Brief idea)		
	51st	Buchholz Relay, Tap Changer (off load and on load) (Brief idea)	26th	REVISION PRACTICAL-5
	52nd	Types of three phase transformer i.e. delta-delta, delta-star, star-delta and star-star		
14th	53rd	Conditions for parallel operation (only conditions are to be studied)	27th	REVISION PRACTICAL-6
	54th	On load tap changer		
	55th	Difference between power and distribution transformer	28th	REVISION PRACTICAL-6
	56th	Cooling of transformer		

15th	57th	REVISION UNIT-4	29th	REVISION PRACTICAL-7&8
	58th	REVISION UNIT-4		
	59th	REVISION UNIT-4	30th	REVISION PRACTICAL-7&8
	60th	REVISION UNIT-4		