LESSON PLAN

Discipline:- Elect. Engg.	Semester-4th	Name of the teaching faculty:- Sri Suryamani Sahoo
Subject:- Energy Conversion-1	No. of days/per week class allotted- 04+1(T)	Semester from date : 09.12.2019 to 31.03.2020 No. of weeks :- 15 (excluding X-Mass Holidays)

Week	Class day	Theory
1st	1st	**1. DC Generator:-** Introduction to Generator and its operating principle
	2nd	Constructional features of DC machine, Yoke, Pole, field winding
	3rd	Armature, Commutator, Armature winding
	4th	Back pitch, front pitch, resultant pitch and commutator pitch simple lap winding
	5th	Doubt clear & problem discussion.
2nd	1st	Simple wave winding, Dummy coils
	2nd	Different types of DC machines (shunt, series and compound)
	3rd	Derivation of EMF equation DC generator solve problems
	4th	Solving numerical problems
	5th	Doubt clear & problem discussion.
3rd	1st	Losses and efficiency of DC generator. Condition for maximum efficiency
	2nd	Numerical problem discussion
	3rd	Armature reaction in DC machine
	4th	Commutation and methods of improving commutation
	5th	Doubt clear & problem discussion.
4th	1st	Role of inter poles and compensating winding in commutation
	2nd	Characteristics of DC generator
	3rd	Application of different types of DC generator
	4th	Concept of critical resistannce and critical speed of DC shunt generator
	5th	Doubt clear & problem discussion.

5th	1st	Conditions of build up of emf of DC generator
	2nd	Parallel operation of DC generator
	3rd	Uses of DC generator
	4th	Numerical problem discussion
	5th	Doubt clear & problem discussion.
6th	1st	**2. DC Motor:-** Basic working principle of DC motor
	2nd	Significance of back emf in DC motor.
	3rd	Voltage equation of DC motor and condition for maximum power output and problem discussion.
	4th	Derivation of torque equation & its numerical proble.
	5th	Doubt clear & problem discussion.
7th	1st	Characteristics of shunt, series motors.
	2nd	Characteristic of compound motors and their application.
	3rd	Starting method of shunt, series motors, compound motor.
	4th	Speed control of DC shunt motors by flux control method. Armature voltage control method numerical problem.
	5th	Doubt clear & problem discussion.
8th	1st	Speed control of DC series motors by field flux control method, Tapped field method.
	2nd	Speed control of DC series motor by series parallel method & numerical problem.
	3rd	Numerical problem discussion
	4th	Determination of efficiency of DC machine by Brake test method & numerical problem.
	5th	Doubt clear & problem discussion.
9th	1st	Determination of efficiency of DC machine by Swinburne's test method & numerical problem.
	2nd	Numerical problem discussion
	3rd	Losses and efficiency and power stages of DC motor numerical problem.
	4th	Uses of DC motor, numerical problem.
	5th	Doubt clear & problem discussion.

10th	1st	Numerical problem discussion	
	2nd	**3. Single Phase Transformer:-** Working principle of transformer. Introduction.	
	3rd	Construction. Arrangement of core & winding in different types of transformer.	
	4th	Brief ideal about transformer accessories such as conservator, tank, breather and explosion vent etc.	
	5th	Doubt clear & problem discussion.	
11th	1st	Discussion of different types of cooling methods.	
	2nd	Discussion of procedure for care and maintenance.	
	3rd	Emf equation of transformer. Numerical problem.	
	4th	Ideal transformer. Voltage transformation ratio. Opertion of transformer at no load, onload with phaser diagram.	
	5th	Doubt clear & problem discussion.	
12th	1st	Equivalent resistance, leakage reactance and impedance of transformer.	
	2nd	Phaser diagram of transformer on load, with winding resistance and magentic leakage with using UPF.	
	3rd	Same using leading pf and logging pf load.	
	4th	Explanation of equivalent ckt and numerical problem.	
	5th	Doubt clear & problem discussion.	
13th	1st	Approximate and exact voltage drop calculation of a transformer.	
	2nd	Regulationof transformer.	
	3rd	Different types of losses in a transformer. Explain open ckt test.	
	4th	Explain short circuit test. Numerical problem.	
	5th	Doubt clear & problem discussion.	
14th	1st	Explain efficiency, efficiency at different load and power factors. Condition for maximum efficiency.	
	2nd	Numerical problem discussion	
	3rd	Explain all day efficiency (Solved problems)	
	4th	Determination of load corresponding to maximum efficiency. Parallel operation of single phase transformer.	
	5th	Doubt clear & problem discussion.	

15th	1st	**4. Auto Transformer:-** Constructional features of Auto transformer. Working principle of single phase Auto transformer.
	2nd	Uses of auto transformer. Comparision of Auto transformer with a two winding transformer (Saving of copper)
	3rd	Use of Auto transformer. Explain tabe changer with transformer (onload and off load condition). **5. Instrument Transformers:-** Explain current transformer & potential transformer.
	4th	Define ratio error, phase angle error, burden. Use of CT & PT
	5th	Doubt clear & problem discussion.