PSIET,KARANDA,DHENKANAL

LESSON PLAN

Session (2022-2023)

Discipline: Electrical Engineering.	**Semester:**4th	**Name of the Teaching Faculty:** Manibhadra Chand, Lecturer
Subject: Energy Conversion-1 ,Theory-1	**No. Of Days/Week**:5	**Start Date**: 15/02/2023 **End Date** : 23/05/2023

Week	Class Day	Theory/Practical Topics
1st	1st	**DC Generator-** Operating principle of generator
	2nd	Constructional features of DC machine (Yoke, Pole & field winding, Armature, Commutator)
	3rd	Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch
	4th	Simple Lap and wave winding, Dummy coils
	5th	Review Class
2nd	1st	Different types of D.C. machines (Shunt, Series and Compound)
	2nd	Derivation of EMF equation of DC generators with problems.
	3rd	Losses and efficiency of DC generator.
	4th	Condition for maximum efficiency and numerical problems
	5th	Review Class
3rd	1st	Armature reaction in D.C. machine
	2nd	Commutation and methods of improving commutation
	3rd	Role of inter poles and compensating winding in commutation
	4th	Characteristics of D.C. Generators
	5th	Quiz Test
4th	1st	Application of different types of D.C. Generators, Concept of critical resistance and critical speed of DC shunt generator
	2nd	Conditions of Build-up of emf of DC generator,
	3rd	Parallel operation of D.C. Generators,
	4th	Uses of D.C generators
	5th	Review Class
5th	1st	**DC Motor-** Basic working principle of DC motor, Significance of back emf in D.C. Motor
	2nd	Voltage equation of D.C. Motor and condition for maximum power output(simple problems)
	3rd	Derive torque equation (solve problems)

	4th	Characteristics of shunt, series and compound motors and their application
	5th	Review Class
6th	1st	Starting method of shunt, series and compound motors
	2nd	Speed control of D.C shunt motors by Flux control method. Armature voltage Control method
	3rd	Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method
	4th	Determination of efficiency of D.C. Machine by Brake test method
	5th	Quiz Test
7th	1st	Numerical Problems
	2nd	Determination of efficiency of D.C. Machine by Swinburne's Test method
	3rd	Numerical Problems
	4th	Losses, efficiency and power stages of D.C. motor(solve numerical problems)
	5th	Review class
8th	1st	Uses of D.C. motors
	2nd	**Single Phase Transformer-** Working principle of transformer.
	3rd	Constructional feature of Transformer
	4th	Arrangement of core & winding in different types of transformer
	5th	Review Class
9th	1st	Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc
	2nd	Explain types of cooling methods
	3rd	State the procedures for Care and maintenance
	4th	EMF equation of transformer
	5th	Review Class
10th	1st	Ideal transformer voltage transformation ratio
	2nd	Operation of Transformer at no load with phasor diagram
	3rd	Operation of Transformer on load with phasor diagram
	4th	Equivalent Resistance, Leakage Reactance and Impedance of transformer.
	5th	Review Class
11th	1st	To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load.
	2nd	To explain Equivalent circuit and solve numerical problems
	3rd	Approximate & exact voltage drop calculation of a Transformer

	4th	Regulation of transformer
	5th	*Review Class*
12th	1st	Different types of losses in a Transformer
	2nd	Review Class
	3rd	Explain Open circuit and.(Solve numerical problems)
	4th	Explain Short Circuit test .(Solve numerical problems)
	5th	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
13th	1st	Explain All Day Efficiency
	2nd	Numerical Problems
	3rd	Determination of load corresponding to Maximum efficiency.
	4th	Parallel operation of single phase transformer
	5th	Review Class
14th	1st	**Autotransformer-** Constructional features of Auto transformer
	2nd	Working principle of single phase Auto Transformer.
	3rd	Comparison of Auto transformer with a two winding transformer (saving of Copper).
	4th	Uses of Auto transformer
	5th	Review Class
15th	1st	Explain Tap changer with transformer (on load and off load condition)
	2nd	**Instrument Transformers-** Explain Current Transformer and Potential Transformer
	3rd	Define Ratio error, Phase angle error, Burden
	4th	Uses of C.T. and P.T
	5th	*Review Class*

15/12/23

Signature of the faculty

Signature of the Principal