LESSION PLAN FOR THE SESSION 2024-25

Discipline:- **Electrical Engineering**	Semester:- 4TH	Name of the teaching faculty:- **TUKURAJ SOREN, Lecturer (EE)**
Subject:- **ENERGY CONVERSION-1**	No. of days/ per week class allotted:-5	From 04.02.2025 to 17.05.2025
Week	**No. Of Class**	**Topic To Be Taught**
1st	1st	**D.C GENERATOR** Operating principle of generator Constructional features of DC machine.
	2nd	Yoke, Pole & field winding, Armature, Commutator Armature winding, back pitch, Front pitch, Resultant pitch and commutator pitch.
	3rd	Simple Lap and wave winding, Dummy coils
	4th	Different types of D.C. machines (Shunt, Series and Compound)
	5th	Derivation of EMF equation of DC generators. (Solve problems)
2nd	1st	Losses and efficiency of DC generator
	2nd	Condition for maximum efficiency and numerical problems
	3rd	Armature reaction in D.C. machine
	4th	Commutation and methods of improving commutation
	5th	Role of inter poles and compensating winding in commutation
3rd	1st	Characteristics of D.C. Generators
	2nd	Application of different types of D.C. Generators
	3rd	Concept of critical resistance and critical speed of DC shunt generator
	4th	Conditions of Build-up of emf of DC generator
	5th	Parallel operation of D.C. Generators
4th	1st	Uses of D.C generators
	2nd	Numerical Problems
	3rd	**D. C. MOTORS** Basic working principle of DC motor
	4th	Significance of back emf in D.C. Motor
	5th	Voltage equation of D.C. Motor Condition for maximum power output(simple problems)
5th	1st	Derive torque equation (solve problems)
	2nd	Characteristics of shunt motors and their application
	3rd	Characteristics of series motors and their application
	4th	Characteristics of compound motors and their application
	5th	Starting method of shunt motors Starting method of series motors
6th	1st	Starting method of compound motors
	2nd	Speed control of D.C shunt motors by Flux control method & Armature voltage Control
	3rd	Speed control of D.C. series motors by Field Flux control method, Tapped field method & series parallel

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	4th	Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems)
	5th	
7th	1st	Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems)
	2nd	Losses, efficiency and power stages of D.C. motor (solve numerical problems)
	3rd	Uses of D.C. motors, Numerical problems solved
	4th	Numericals
	5th	**Single Phase transformer** Working principle of transformer
8th	1st	Constructional feature of Transformer Arrangement of core & winding in different types of transformer
	2nd	
	3rd	Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc.
	4th	Explain types of cooling methods
	5th	State the procedures for Care and maintenance
9th	1st	EMF equation of transformer
	2nd	Ideal transformer voltage transformation ratio
	3rd	Operation of Transformer at no load, on load with phasor diagrams
	4th	Equivalent Resistance, Leakage Reactance and Impedance of transformer
	5th	To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load.
10th	1st	To explain Equivalent circuit and solve numerical problems
	2nd	Approximate & exact voltage drop calculation of a Transformer
	3rd	Regulation of transformer
	4th	
	5th	Different types of losses in a Transformer Explain Open circuit and.(Solve numerical problems)
1th	1st	Explain Short Circuit test.(Solve numerical problems)
	2nd	Explain Efficiency & solved Problems
	3rd	Efficiency at different loads and power factors
	4th	Condition for maximum efficiency (solve problems)
	5th	Explain All Day Efficiency (solve problems)
2th	1st	Determination of load corresponding to Maximum efficiency
	2nd	Parallel operation of single phase transformer
	3rd	Numericals
	4th	Numericals
	5th	**AUTO TRANSFORMER** Constructional features of Auto transformer
3th	1st	Working principle of single phase Auto Transformer
	2nd	Comparison of Auto transformer with an two winding transformer Saving of copper in Auto Transformer
	3rd	Uses of Auto transformer Explain Tap changer with transformer on load condition
	4th	Previous year question discussion(Auto Transformer)

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	5th	**INSTRUMENT TRANSFORMERS** Explain Current Transformer
14th	1st	Explain Potential Transformer
	2nd	Define Ratio error, Phase angle error, Burden.
	3rd	Uses of C.T. and P.T.
	4th	Important questions discussion
	5th	Previous year question discussion(Instrumentation Transformer)
15th	1st	Revision
	2nd	Revision
	3rd	Revision
	4th	Revision
	5th	Revision

Teaching Faculty

H.O.D E.E