DEPARTMENT OF ELECTRICAL ENGINEERING Govt. Polytechnic Jajpur, Ragadi

LESSON PLAN FOR ACADEMIC SESSION - 2024-25 ENERGY CONVERSION-I

Course Code: TH.1	Semester: 4th	
Total Periods: 75 Periods	Examination: 3 Hours	
Lecture Periods: 4 P/Week	Internal Assessment : 20 Marks	
Tutorial: 1P/week	End Semester Examination : 80 Marks	
Maximum Marks: 100		
Semester From Date: 04/02/2025 To Date: 17/05/2025		
Name of Teaching Faculty: Mrs. Jyotirmayee Sethy (Lect. Electrical)		

WEEK	PERIOD	TOPIC
1st	1st	Introduction to electrical machine D.C Generator
	2nd	Explain principle of operation, Explain Constructional feature
	3 rd	Armature winding, back pitch, Front pitch, Resultant pitch and commentator-pitch.
	4 th	Simple Lap and wave winding (problems on winding diagram)
	5 th	Explain Different types of D.C. machines i.e. Shunt, Series machine with problem solving methods.
2 nd	1 st	Explain Different types of D.C. machines i.e. Compound machine with problem solving methods.
	2 nd	Derive EMF equation of DC generators. (Solve problems)
	3rd	Explain Armature reaction in D.C. machine.
	4 th	Explain commutation in D.C. machine.
	5 th	Explain Methods of improving commutation (Resistance and emf commutation)
3rd	1 st	Explain role of inter poles and compensating winding. (solve problems)
	2 nd	Characteristics of D.C. Generators with problem solving methods
	3 rd	Characteristics of D.C. Generators with problem solving methods
	4 th	State application of different types of D.C. Generators.
	5 th	Concept of critical resistance causes of failure of development of emf.

4 th	1 st	Explain losses of D.C. machines & numerical problems.
	2 nd	Explain efficiency of D.C. machines, condition for maximum
	_	efficiency and numerical problems.
	3 rd	Explain parallel operation of D.C. Generators.
	4 th	Explain parallel operation of D.C. Generators.
	5 th	Introduction to D. C. MOTORS
5 th	1 st	Explain basic working principle of DC motor
	2 nd	State Significance of back emf in D.C. Motor.

Derive torque (Equation of Armature Torque and shaft Torque) (solve problems) 5n		3rd	Derive voltage equation of Motor
(solve problems) Explain performance characteristics of shunt motors and their application. (Solve problems) Explain performance characteristics of series motors and their application. (Solve problems) Explain performance characteristics of compound motors and their application. (Solve problems) Explain performance characteristics of compound motors and their application. (Solve problems) Explain methods of starting shunt, series and compound motors, (solve problems) Explain speed control of D.C shunt motors by Flux control method. Pulx control method This Armature voltage (rheostatic) Control method. Explain speed control of Series motors by Flux control method. Explain speed control of series motors by Flux control method. Explain speed control of series motors by series parallel method. Explain determination of efficiency of D.C. Machine by break test method. Explain determination of efficiency of D.C. Machine by Swinburne's Test method. Explain determination of efficiency of D.C. Machine by Swinburne's Test method. Explain determination of efficiency of D.C. Machine by Swinburne's Test method. Explain for maximum power. Solve numerical problems on losses, efficiency and maximum power. Solve numerical problems on losses, efficiency and maximum power. SINGLE PHASE TRANSFORMER Explain working principle of transformer. Brief ideas about transformer Construction – Arrangement of core & winding in different types of transformer Brief ideas about transformer accessories such as conservator, tank, breather explosion vent etc. Explain types of cooling methods State the procedures for Care and maintenance Explain Transformer on no load and on load phasor diagrams. Explain phasor diagram of transformation ratio Explain Transformer on no load and on load using upf, leading pf and lagging pf.			
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pf and lagging pf.		3 rd	
4th Explain Equivalent circuit and solve numerical problems.			pf and lagging pf.
-		4 th	Explain Equivalent circuit and solve numerical problems.
5th Calculate Approximate & exact voltage drop of a		·	Calculate Approximate & exact voltage drop of a
Transformer.			
11th 1st Calculate Regulation of various loads and power factor.	11 th	1st	Calculate Regulation of various loads and power factor.
2nd Explain Different types of losses in a Transformer.		2 nd	Explain Different types of losses in a Transformer.
3rd Solve problems on losses of transformer.		3 rd	_
4th Explain Open circuit test.		4 th	1 1
5th Explain Short circuit test.		5 th	Explain Short circuit test.

12 th	1 st	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
	7 nd	Explain All Day Efficiency
	3rd	Solve problems on all day efficiency.
	4 th	Explain determination of load corresponding to Maximum
		efficiency.
	5 th	Explain parallel operation of single phase transformer
13 th	1 st	AUTO TRANSFORMER
		Explain constructional features
	2 nd	Explain Working principle of single phase Auto
		Transformer.
	3 rd	State Comparison of Auto transformer with an two winding transformer (saving of Copper)
	4 th	State Comparison of Auto transformer with an two winding transformer (saving of Copper)
	5 th	State Uses of Auto transformer.
14 th	1 st	Explain Tap changer with transformer (on load and off load condition)
	2 nd	INSTRUMENT TRANSFORMERS Explain Current Transformer
	3 rd	Potential Transformer
	4 th	Define Ratio error, Phase angle error, Burden
	5 th	Define Ratio error, Phase angle error, Burden
15 th	1 st	Uses of C.T. and P.T.
	2 nd	Tutorial
	3 rd	Tutorial
	4 th	Tutorial
	5 th	Tutorial

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