LESSON PLAN

SUB: ENERGY CONVERSION - I

BRANCH:- ELECTRICAL ENGG.

SEMESTER: 4th

NAME OF FACULTY: NIBEDITA HO

GOVERNMENT POLYTECHNIC, BHADRAK
SESSION:2023-24

Hod, Electrical
HOD (ELECT.)
G.P.BHADRAK

Academic Co-ordinator

Academic Co-ordinator

Principal
Govt. Polytechnic, Bhadrak

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Govt. Polytechnic,
Bhadrak

Discipline: Electrical Engg.	Semester: 4th	Name of the Teaching Faculty : NIBEDITA HO (Lect. Electrical Engg.)	
Subject: Energy Conversion - I	No. of Days/per week class allotted:5	Semester from date: 16.01.2024 To Date: 26.04.2024	
		No. of Weeks:15	
Week	Class Day	Theory	
1st	1st	**D.C GENERATOR**	
	2nd	Operating principle of generator	
	3rd	Constructional features of Yoke, Pole & field winding, Armature, Commutator	
	4th	Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch	
	5th	Simple Lap and wave winding, Dummy coils.	
2nd	1st	Derivation of EMF equation of DC generators. (Solve problems)	
	2nd	Solve problems	
	3rd	Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems	
	4th	Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems	
	5th	Question discussion & doubt clearing	
3rd	1st	Armature reaction in D.C. machine	
	2nd	Commutation and methods of improving commutation & Role of inter poles and compensating winding in commutation	
	3rd	Characteristics of D.C. Generators	
	4th	Characteristics of D.C. Generators	
	5th	Characteristics of D.C. Generators	
4th	1st	Question discussion & Doubt clearing	
	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.	
5th	1st	**D. C. MOTORS**	
	2nd	Basic working principle of DC motor Significance of back emf in D.C. Motor.	
	3rd	Voltage equation of D.C. Motor and condition for maximum power output(simple problems)	
	4th	Voltage equation of D.C. Motor and condition for maximum power output(simple problems)	
	5th	Derive torque equation (solve problems)	
6th	1st	Characteristics of shunt, series and compound motors and their application	

	2nd	Characteristics of shunt, series and compound motors and their application
	3rd	Starting method of shunt, series and compound motors. Speed control of D.C shunt motors by Flux control method.
	4th	Armature voltage Control method. Solve problems Question discussion & doubt clearing
	5th	Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method
7th	1st	Steady state error and error constants.
	2nd	Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems)
	3rd	Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems)
	4th	Losses, efficiency and power stages of D.C. motor(solve numerical problems.
	5th	solve numerical problems
	1st	solve numerical problems
8th	2nd	
	3rd	Uses of D.C. motors
	4th	**SINGLE PHASE TRANSFORMER**
	5th	Constructional feature of Transformer. Arrangement of core & winding in different types of transformer.
	1st	Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc.
9th	2nd	Explain types of cooling methods
	3rd	State the procedures for Care and maintenance .
	4th	EMF equation of transformer .
	5th	Question discussion & doubt clearing
	1st	Ideal transformer voltage transformation ratio.
10th	2nd	Equivalent Resistance, Leakage Reactance and Impedance of transformer.
	3rd	To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load.
	4th	To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf and leading pf load.
	5th	To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using lagging pf load.
	1st	To explain Equivalent circuit and solve numerical problems.

11th	2nd	Solve numerical problems.
	3rd	Approximate & exact voltage drop calculation of a Transformer.
	4th	Regulation of transformer
	5th	Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems)
12th	1st	Explain Efficiency. efficiency at different loads and power factors. condition for maximum efficiency (solve problems)
	2nd	Explain All Day Efficiency (solve problems)
	3rd	Determination of load corresponding to Maximum efficiency
	4th	REVISION
	5th	Question discussion
13th	1st	**AUTO TRANSFORMER** Constructional features of Autotransformer. Working principle of 1φ Autotransformer.
	2nd	Comparison of Auto transformer with an two winding transformer (saving of Copper).
	3rd	Uses of Auto transformer. Explain Tap changer with transformer (on load and off load condition)
	4th	Explain Tap changer with transformer (on load and off load condition)
	5th	Question discussion & doubt clearing
14th	1st	**INSTRUMENT TRANSFORMERS** Explain Current Transformer.
	2nd	Explain Potential Transformer
	3rd	Define Ratio error.
	4th	Phase angle error. Burden.
	5th	Question discussion
15th	1st	Uses of C.T. and P.T.
	2nd	Uses of P.T.
	3rd	Question discussion & doubt clearing
	4th	Question discussion & doubt clearing
	5th	Question discussion & doubt clearing

SIGNATURE OF FACULTY

Lect. in Elect. Engg.
Govt. Poly. Bhadrak