



UTKAL INSTITUTE OF ENGINEERING & TECHNOLOGY

DISCIPLINE: electrical engineering	SEMESTER: 4TH Sem	NAME OF THE TEACHING FACULTY: KALAKAR MOHANTY		
SUBJECT: Th1. ENERGY CONVERSION – I	No of Days/Per week class allotted: 5 Class P/W(75)	Semester From Date:16/01/2024 To Date:26/04/2024 No. Of Weeks: 12		
WEEK	CLASS DAY	THEORY TOPICS <u>PART-A (DC GENERATORS)</u>	REMARKS	
1 st	1 st	Operating principle of generator	Date	Dean/Principal
	2 nd	Constructional features of DC machine.		
	3 rd	Yoke, Pole & field winding, Armature, Commutator		
	4 th	Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch.		
	5 th	Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch.		
2 nd	1 st	Simple Lap and wave winding, Dummy coils.		
	2 nd	Different types of D.C. machines (Shunt, Series and Compound)		
	3 rd	Derivation of EMF equation of DC generators. (Solve problems)		
	4 th	Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems.		
	5 th	Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems.		
3 rd	1 st	Armature reaction in D.C. Machine		
	2 nd	Commutation and methods of improving commutation		
	3 rd	Role of inter poles and compensating winding in commutation		
	4 th	Characteristics of D.C. Generators		
	5 th	Application of different types of D.C. Generators.		
4 th	1 st	Concept of critical resistance and critical speed of DC shunt generator		
	2 nd	Conditions of Build-up of emf of DC generator, Parallel operation of D.C. Generators, Uses of D.C generators.		
	3 rd	PART B (D. C. MOTORS) ; Basic working principle of DC motor		
	4 th	Significance of back emf in D.C. Motor		
	5 th	Voltage equation of D.C. Motor and condition for maximum power output(simple problems)		

5 th	1 st	Derive torque equation (solve problems)		
	2 nd	Characteristics of shunt, series and compound motors and their application		
	3 rd	Starting method of shunt, series and compound motors.		
	4 th	Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems		
	5 th	Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems		
6 th	1 st	Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems		
	2 nd	Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems		
	3 rd	Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems)		
	4 th	Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems)		
	5 th	Losses, efficiency and power stages of D.C. motor(solve numerical problems)		
7 th	1 st	Losses, efficiency and power stages of D.C. motor(solve numerical problems)		
	2 nd	Uses of D.C. motors		
	3 rd	<u>PART-C (SINGLE PHASE TRANSFORMER)</u> : Working principle of transformer		
	4 th	Constructional feature of Transformer.		
	5 th	Arrangement of core & winding in different types of transformer		
8 th	1 st	Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc.		
	2 nd	Explain types of cooling methods		
	3 rd	State the procedures for Care and maintenance.		
	4 th	EMF equation of transformer		
	5 th	Ideal transformer voltage transformation ratio		
9 th	1 st	Operation of Transformer at no load, on load with phasor diagrams.		
	2 nd	Equivalent Resistance, Leakage Reactance and Impedance of transformer		
	3 rd	To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load.		
	4 th	To explain Equivalent circuit and solve numerical problems.		
	5 th	Approximate & exact voltage drop calculation of a Transformer.		
10 th	1 st	Regulation of transformer.		
	2 nd	Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems)		
	3 rd	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)		
	4 th	Explain All Day Efficiency (solve problems)		

	5 th	Determination of load corresponding to Maximum efficiency		
11 th	1 st	Parallel operation of single phase transformer		
	2 nd	Parallel operation of single phase transformer		
	3 rd	<u>PART-C (AUTO TRANSFORMER)</u> : Constructional features of Auto transformer , Working principle of single phase Auto Transformer.		
	4 th	Comparison of Auto transformer with an two winding transformer (saving of Copper)., Uses of Auto transformer.		
	5 th	Explain Tap changer with transformer (on load and off load condition)		
12 th	1 st	<u>PART-D (INSTRUMENT TRANSFORMERS)</u> : _____ Explain Current Transformer and Potential Transformer		
	2 nd	Explain Current Transformer and Potential Transformer		
	3 rd	Define Ratio error, Phase angle error, Burden		
	4 th	Define Ratio error, Phase angle error, Burden		
	5 th	Uses of C.T. and P.T.		
HOD		DEAN	PRINCIPAL	
				