

ACADEMIC SESSION : 2024-25

Discipline : Electrical Engineering	Semester : 4th	Name of the Teaching Faculty : KIRAN KUMAR BHOI
Subject : ENERGY CONVERSION- I	No. of days / week class allotted	Semester From date: 4/02/2025 to 17/05/2025
Week	Class Day	Theory/ Practical Topics
1ST	1st	Operating principle of generator, Constructional features of DC machine.
	2nd	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.
2ND	1st	Different types of D.C. machines (Shunt, Series and Compound)
	2nd	Derivation of EMF equation of DC generators. (Solve problems)
	3rd	Losses and efficiency of DC generator. Condition for maximum efficiency.
	4th	numerical problems.
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
4TH	1st	Application of different types of D.C. Generators
	2nd	Concept of critical resistance and critical speed of DC shunt generator
	3rd	Conditions of Build-up of emf of DC generator.
	4th	Parallel operation of D.C. Generators.
5TH	1st	Uses of D.C generators.
	2nd	Basic working principle of DC motor
	3rd	Significance of back emf in D.C. Motor.
	4th	Voltage equation of D.C. Motor and condition for maximum power output
6TH	1st	solve problems
	2nd	Derive torque equation (solve problems)
	3rd	Characteristics of shunt, series and compound motors and their application.

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

	4 th	Explain Efficiency, efficiency at different loads and power factors
13 th	1 st	condition for maximum efficiency (solve problems)
	2 nd	Explain All Day Efficiency (solve problems)
	3 rd	Determination of load corresponding to Maximum efficiency.
	4 th	6 Parallel operation of single phase transformer.
14 th	1 st	Constructional features of Auto transformer
	2 nd	Working principle of single phase Auto Transformer
	3 rd	Comparison of Auto transformer with an two winding transformer (saving of Copper)
	4 th	Uses of Auto transformer
15 th	1 st	Explain Tap changer with transformer (on load and off load condition)
	2 nd	Explain Current Transformer and Potential Transformer
	3 rd	Define Ratio error, Phase angle error, Burden.
	4 th	1.3 Uses of C.T. and P.T.

KKB
3.2.25

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