

Discipline ÷ Electrical Engg	Semester 4th	Name of the teaching Faculty S. Barik
Subject ÷ Energy Conversion-1	No of days Per week class all 4+1	Semester From Date - 14.03.2022 TO Date - 10.06.2022 No of weeks - 15

Months	Weeks	Classday	Theory Topics
March	1st and	1st	1. D.C Generator 1.1 Operating principle of generator
		2nd	* Continue 1.2 constructional features of DC machine.
		3rd	1.2.1 yoke, pole & field winding, Armature, commutator.
		4th	1.2.2 Armature winding, back pitch, front pitch, Resultant pitch and commutator pitch
		5th	1.2.3 simple lap and wave winding, dummy coils.
	3rd	1st	* Continue
		2nd	1.3. Different types of D.C. machines (shunt, series and compound)
		3rd	* Tutorial
		4th	1.4. Derivation of Emf equation of DC generators. (solve problems)

Months	Weeks	Class day	Theory Topics
		5th	1.5 Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems.
	4th	1st	1.6 Armature reaction in DC machine
		2nd	1.7 Commutation and methods of improving commutation.
		3rd	1.7.1 Role of Sinter poles and damping winding in commutation.
		4th	1.8 characteristics of DC generators.
		5th	1.9 Application of different types of DC Generators
April	1st	1st	1.10 Concept of critical resistance and critical speed of dc shunt generator.
		2nd	1.11 Conditions of build-up of emf of DC generator.
		3rd	1.12 Parallel operation of DC generators
		4th	1.13 uses of DC generators
	2nd	1st	2- DC motors and basic working principle of DC motor
		2nd	Tutorial

Months	Weeks	Class day	Theory Topics
		3rd	2.2 Significance of back emf in DC motor.
		4th	2.3 voltage equation of DC motor and condition for maximum power (simple problems)
		5th	2.4 Torque torque equation. (solve problems)
	3rd	1st	2.5 characteristics of shunt, series and compound motors and their application.
		2nd	2.6 starting method of shunt, series and compound motor.
		3rd	2.7 speed control of DC shunt motor by flux control method: Armature voltage control method. solve problems.
		4th	2.8 speed control of DC series motor by field flux control method, Tapped field method and series parallel method.
		5th	2.9 Determination of efficiency of DC machine by brake test method (solve numerical problems)
	4th	1st	2.10 Determination of efficiency of DC machine by Swinburn's Test method (solve numerical problems)

Months	Weeks	Class day	Theory TOPICS
		2nd	2.11 Losses, efficiency and power stages of D.C. motors (Solve numerical problems)
		3rd	* Tutorial
		4th	2.12 Uses of D.C. motors
		5th	* Tutorial
			3. SINGLE PHASE TRANSFORMER
May	1st	1st	3.1 working principle of transformer
		2nd	3.2 constructional feature of transformer
		3rd	3.2.1 Arrangement of core & winding in different types of transformer
		4th	3.2.2 Brief ideas about transformer accessories such as conservator tank, breather, and explosion vent.
		5th	3.2.3 Explain types of cooling methods.
	2nd	1st	3.3 state the procedures for care and maintenance.
		2nd	3.4 Emf equation of transformer.
		3rd	3.5 Ideal transformer voltage transformation ratio.
		4th	3.6 operation of transformer at no load on load with phasor diagrams.
		5th	3.7 Equivalent Resistance, leakage Reactance and Impedance of transformer.
3rd	1st	* Tutorial	

Months	Weeks	Class day	Theory TOPICS
		2nd	3.8 To draw phasor diagram of transformer on load, with winding Resistance and magnetic leakage with using pf, leading pf and lagging pf load.
		3rd	3.9 To explain equivalent circuit and solve numerical problems.
		4th	3.10 Approximate exact voltage drop calculation of a transformer.
		5th	3.11 Regulation of transformer.
	4th	1st	3.12 Different types of losses in a transformer explain open circuit and short circuit test. (Solve numerical problems)
		2nd	3.13 Explain efficiency, efficiency at different loads and power factors, conditions for maximum efficiency. (Solve problems)
		3rd	3.14 Explain All day efficiency (Solve problems)
		4th	3.15 Determination of load corresponding to maximum efficiency.
		5th	3.16 Parallel operation of single phase transformer.
June	1st	1st	* Tutorial

Months	weeks	class day	Theory TOPICS
			4. Auto Transformers
		2nd	4.1 Constructional features of auto transformers.
		3rd	4.2 working principle of single phase Auto transformers.
		4th	4.3 Comparison of auto transformers with an two winding transformers (saving of copper).
		5th	4.4 uses of Auto transformers.
	2nd	1st	4.5 Explain tap changes with transformers (on load and off load condition).
		2nd	5- Instrument transformers 1.1 Explain current transformers and potential transformers.
		3rd	1.2 Define Ratio errors, phase angle errors, Burden.
		4th	1.3 Uses of C.T. and P.T
		5th	Solve numerical problem