

LESSON PLAN

Discipline : ELECTRICAL ENGG.	Semester: 4th Sem	Name of the Teaching Faculty : BIJAYA KUMAR BARIK	
Subject : TH-1(ENERGY CONVERSION-1)	No. of Days / per week class allotted : 05	Semester From date :16.01.2024	To Date : 23.05.2024 No. of Weeks : 16
Week	Class Day	Topics	
Week 1 (Feb 4 - Feb 8)	1st	1. D.C GENERATOR 1.1. Operating principle of generator 1.2. Constructional features of DC machine. 1.2.1. Yoke, Pole & field winding, Armature, Commutator	
	2nd	1.2.2. Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch	
	3rd	1.2.3. Simple Lap and wave winding, Dummy coils	
	4th	1.3. Different types of D.C. machines (Shunt, Series and Compound)	
	5th	1.4. Derivation of EMF equation of DC generators. (Solve problems)	
Week 2 (Feb 10 - Feb 15).	1st	1.5. Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems	
	2nd	1.5. Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems	
	3rd	1.6. Armature reaction in D.C. machine	
	4th	1.7. Commutation and methods of improving commutation.1.7.1. Role of inter poles and compensating winding in commutation	
	5TH	1.8. Characteristics of D.C. Generators 1.separately excited generator 2. series wound dc	
Week 3 (Feb 17 - Feb 22)	1st	1.8. Characteristics of D.C. Generators 1.shunt wound dc generator 2. compound wound dc	
	2nd	1.9. Application of different types of D.C. Generators. 1.10. Concept of critical resistance and critical speed of DC shunt generator	
	3rd	1.11. Conditions of Build-up of emf of DC generator. 1.12. Parallel operation of D.C. Generators. A. Parallel operation of series wound D.C. Generators	
	4th	B. Parallel operation of shunt wound D.C. Generators	
	5th	C. Parallel operation of compound wound D.C. Generators	
Week 4 (Feb 24 - Mar 1)	1st	solved numeriacals based on emf equation of dc generator (of all types of dc generator)	
	2nd	solved numeriacals based on emf equation of dc generator (of all types of dc generator)	
	3rd	solved numeriacals based on emf equation of dc generator (of all types of dc generator)	
	4th	CLASS TEST -1	
	5th	2. D. C. MOTORS 2.1. Basic working principle of DC motor 2.2. Significance of back emf in D.C. Motor	
Week 5 (Mar 3 - Mar 8)	1st	2.3. Voltage equation of D.C. Motor and condition for maximum power output(simple problems)	
	2nd	2.3. Voltage equation of D.C. Motor and condition for maximum power output(simple problems)	
	3rd	2.4. Derive torque equation (solve problems)	
	4th	2.4. Derive torque equation (solve problems)	
	5th	2.5. Characteristics of shunt motors and their application	
Week 6 (Mar 10 - Mar 15)	1st	2.5. Characteristics of series motors and their application.	
	2nd	2.5. Characteristics of compound motors and their application.	
	3rd	2.6. Starting method of shunt, series and compound motors(necessity of starter ,2point starter)	

	4th	2.6. Starting method of shunt, series and compound motors(3 point and 4point starter)
	5th	2.7. Speed control of D.C shunt motors by Flux control method.

Week 7 (Mar 17 - Mar 22)	1st	2.7. Speed control of D.C shunt motors by Armature voltage Control method. Solve problems
	2nd	2.8. Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method
	3rd	2.9. Determination of efficiency of D.C. Machine by Brake test method
	4th	2.10. Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems)
	5th	solved numericals related to brake test method and Swinburne's Test method.

Week 8 (Mar 24 - Mar 29)	1st	2.11. Losses, efficiency and power stages of D.C. motor(solve numerical problems)
	2nd	2.11. Losses, efficiency and power stages of D.C. motor(solve numerical problems)
	3rd	3. SINGLE PHASE TRANSFORMER 3.1 Working principle of transformer. 3.2 Constructional feature of Transformer. 3.2.1 Arrangement of core & winding in different types of transformer.
	4th	INTERNAL ASSESSMENT
	5th	3.2.2 Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc. 3.2.3 Explain types of cooling methods

Week 9 (Apr 1 - Apr 5)	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 SOLVED NUMERICALS
	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.

Week 10 (Apr 7 - Apr 12)	1st	3.8 To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load.
	2nd	3.9 To explain Equivalent circuit and solve numerical problems
	3rd	3.10 Approximate & exact voltage drop calculation of a Transformer
	4th	3.11 Regulation of transformer.
	5th	3.12 Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems)

Week 11 (Apr 14 - Apr 19)	1st	3.12 Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems)
	2nd	3.12 Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems)
	3rd	3.13 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
	4th	3.13 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
	5th	3.13 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)

Week 12 (Apr 21 - Apr 26)	1st	3.14 Explain All Day Efficiency (solve problems)
	2nd	3.15 Determination of load corresponding to Maximum efficiency
	3rd	3.16 Parallel operation of single phase transformer.
	4th	3.16 Parallel operation of single phase transformer.
	5th	3.16 Parallel operation of single phase transformer.

Week 13 (Apr 28 - May 3)	1st	CLASS TEST 2
	2nd	4. AUTO TRANSFORMER
	3rd	4.1. Constructional features of Auto transformer.
	4th	4.2. Working principle of single phase Auto Transformer
		4.3. Comparison of Auto transformer with an two winding transformer (saving of Copper)

	5th	4.4. Uses of Auto transformer
Week 14 (May 5 - May 10)	1st	4.5. Explain Tap changer with transformer (on load and off load condition)
	2nd	4.5. Explain Tap changer with transformer (on load and off load condition)
	3rd	5. INSTRUMENT TRANSFORMERS 1.1 Explain Current Transformer and Potential Transformer
	4th	1.1 Explain Current Transformer and Potential Transformer
	5th	1.2 Define Ratio error, Phase angle error, Burden.
Week 15 (May 12 - May 17)	1st	1.3 Uses of CT and PT.
	2nd	Solving and discussing previous year questions
	3rd	Solving and discussing previous year questions
	4th	Solving and discussing previous year questions
	5th	Solving and discussing previous year questions