

ACADEMIC LESSON PLAN OF SUMMER 2024

Discipline: ELECTRICAL	Semester: 4 th Sem (Sec A)	Name of the Teaching Faculty: Sunita Oram
Subject: ENERGY CONVERSION-I TH. 1	No. of days/per week class allotted:4p/week Tutorial:1p/week	Semester From: 16 th January2024 to 26 th April 2024 No. of weeks:15 weeks
Week	Class Day	Theory Topics
1 st	1 st	1.D.C GENERATOR: 1.1 Operating principle of generator
	2 nd	1.2 Constructional features of DC machine 1.2.1 Yoke, Pole & field winding, Armature, Commutator
	3 rd	1.2.2 Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch.
	4 th	1.2.3 Simple Lap and wave winding, Dummy coils
	5 th	Tutorial
2 nd	1 st	1.3 Different types of D.C. machines (Shunt, Series and Compound)(contd...)
	2 nd	1.3 Different types of D.C. machines (Shunt, Series and Compound)
	3 rd	1.4 Derivation of EMF equation of DC generators. (Solve problems) (contd...)
	4 th	1.4 Derivation of EMF equation of DC generators. (Solve problems)
	5 th	Tutorial
3 rd	1 st	1.5 Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems(contd..)
	2 nd	1.5 Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems.
	3 rd	1.6. Armature reaction in D.C. machine (contd...)
	4 th	1.6. Armature reaction in D.C. machine
	5 th	Tutorial
4 th	1 st	1.7. Commutation and methods of improving commutation
	2 nd	1.7 Commutation and methods of improving commutation (contd...)
	3 rd	1.8 Characteristics of D.C. Generators 1.9. Application of different types of D.C. Generators.
	4 th	1.10. Concept of critical resistance and critical speed of DC shunt generator 1.11. Conditions of Build-up of emf of DC generator.
	5 th	Tutorial
5 th	1 st	1.12. Parallel operation of D.C. Generators. 1.13. Uses of D.C generators.
	2 nd	2.D. C. MOTORS 2.1 Basic working principle of DC motor.
	3 rd	2.2 Significance of back emf in D.C. Motor
	4 th	2.3 Voltage equation of D.C. Motor and condition for maximum power output (simple Problems)(contd...)
	5 th	Tutorial
6 th	1 st	2.3 Voltage equation of D.C. Motor and condition for maximum power output(simple problems)
	2 nd	2.4. Derive torque equation (solve problems)(contd...)
	3 rd	2.4. Derive torque equation (solve problems)
	4 th	2.5. Characteristics of shunt, series and compound motors and their application.

	5 th	Tutorial
7 th	1 st	2.6. Starting method of shunt, series and compound motors.
	2 nd	2.7. Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems(contd...)
	3 rd	2.7. Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems
	4 th	2.8. Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method
	5 th	Tutorial
8 th	1 st	2.9. Determination of efficiency of D.C. Machine by Brake test method (solve numerical problems)
	2 nd	2.10. Determination of efficiency of D.C. Machine by Swinburne's Test method (solve numerical problems)
	3 rd	2.11. Losses, efficiency and power stages of D.C. motor (solve numerical problems) (contd...)
	4 th	2.11. Losses, efficiency and power stages of D.C. motor (solve numerical problems) 2.12. Uses of D.C. motors
	5 th	Tutorial
9 th	1 st	3. SINGLE PHASE TRANSFORMER 3.1 Working principle of transformer
	2 nd	3.2 Constructional feature of Transformer.
	3 rd	3.2.1 Arrangement of core & winding in different types of transformer.
	4 th	3.2.2 Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc.
	5 th	Tutorial
10 th	1 st	3.2.3 Explain types of cooling methods 3.3 State the procedures for Care and maintenance
	2 nd	3.4 EMF equation of transformer.
	3 rd	3.5 Ideal transformer voltage transformation ratio
	4 th	3.6 Operation of Transformer at no load, on load with phasor diagrams.(contd...)
	5 th	Tutorial
11 th	1 st	3.6 Operation of Transformer at no load, on load with phasor diagrams.
	2 nd	3.7 Equivalent Resistance, Leakage Reactance and Impedance of transformer.
	3 rd	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.(contd...)
	4 th	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.
	5 th	Tutorial
12 th	1 st	3.9 To explain Equivalent circuit and solve numerical problems
	2 nd	3.10 Approximate & exact voltage drop calculation of a Transformer 3.11 Regulation of transformer.
	3 rd	3.12 Different types of losses in a Transformer. Explain Open circuit and Short Circuit test. (Solve numerical problems)(contd...)
	4 th	3.12 Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems)
	5 th	Tutorial
13 th	1 st	3.13 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) (contd..)
	2 nd	3.13 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
	3 rd	3.14 Explain All Day Efficiency (solve problems)
	4 th	3.15 Determination of load corresponding to Maximum efficiency.

	5 th	Tutorial
14 th	1 st	3.16 Parallel operation of single phase transformer.
	2 nd	4. AUTO TRANSFORMER 4.1. Constructional features of Auto transformer. 4.2. Working principle of single phase Auto Transformer
	3 rd	4.3. Comparison of Auto transformer with an two winding transformer (saving of Copper). 4.4. Uses of Auto transformer
	4 th	4.5. Explain Tap changer with transformer (on load and off load condition)
	5 th	Tutorial
15 th	1 st	5. INSTRUMENT TRANSFORMERS 5.1 Explain Current Transformer and Potential Transformer
	2 nd	5.1 Explain Current Transformer and Potential Transformer(contd...)
	3 rd	5.2 Define Ratio error, Phase angle error, Burden.
	4 th	5.3 Uses of C.T. and P.T
	5 th	Tutorial

Signature of Teaching Faculty