ACADEMIC LESSON PLAN OF SUMMER 2024

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

	5th	Tutorial
7th	1st	2.6. Starting method of shunt, series and compound motors.
	2nd	2.7. Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems(contd...)
	3rd	2.7. Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems
	4th	2.8. Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method
	5th	Tutorial
8th	1st	2.9. Determination of efficiency of D.C. Machine by Brake test method (solve numerical problems)
	2nd	2.10. Determination of efficiency of D.C. Machine by Swinburne's Test method (solve numerical problems)
	3rd	2.11. Losses, efficiency and power stages of D.C. motor (solve numerical problems) (contd...)
	4th	2.11. Losses, efficiency and power stages of D.C. motor (solve numerical problems) 2.12. Uses of D.C. motors
	5th	Tutorial
9th	1st	**3. SINGLE PHASE TRANSFORMER** 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 etc.
	5th	Tutorial
10th	1st	3.2.3 Explain types of cooling methods 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.(contd...)
	5th	Tutorial
11th	1st	3.6 Operation of Transformer at no load, on load with phasor diagrams.
	2nd	3.7 Equivalent Resistance, Leakage Reactance and Impedance of transformer.
	3rd	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...)
	4th	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.
	5th	Tutorial
12th	1st	3.9 To explain Equivalent circuit and solve numerical problems
	2nd	3.10 Approximate & exact voltage drop calculation of a Transformer 3.11 Regulation of transformer.
	3rd	3.12 Different types of losses in a Transformer. Explain Open circuit and Short Circuit test. (Solve numerical problems)(contd...)
	4th	3.12 Different types of losses in a Transformer. Explain Open circuit and Short Circuit test.(Solve numerical problems)
	5th	Tutorial
13th	1st	3.13 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems) (contd..)
	2nd	3.13 Explain Efficiency, efficiency at different loads and power factors, condition 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	Tutorial	
14th	1st	3.16 Parallel operation of single phase transformer.	
	2nd	**4. AUTO TRANSFORMER** 4.1. Constructional features of Auto transformer. 4.2. Working principle of single phase Auto Transformer	
	3rd	4.3. Comparison of Auto transformer with an two winding transformer (saving of Copper). 4.4. Uses of Auto transformer	
	4th	4.5. Explain Tap changer with transformer (on load and off load condition)	
	5th	Tutorial	
15th	1st	**5.INSTRUMENT TRANSFORMERS** 5.1 Explain Current Transformer and Potential Transformer	
	2nd	5.1 Explain Current Transformer and Potential Transformer(contd…)	
	3rd	5.2 Define Ratio error, Phase angle error, Burden.	
	4th	5.3 Uses of C.T. and P.T	
	5th	Tutorial	

Amit Kumar Prisay

Signature of Teaching Faculty