LESSON PLAN FOR 4TH SEM ELECTRICAL ENGINEERING .

Discipline Electrical Engg.	Semester:- 4th	Name of the Teaching Faculty:- **NIRMAL KUMAR SAHOO**
Subject:- Energy Conversion-i	No of Days/per Week Class Allotted :- 4	Semester From:- **15th Apr, 2021** To:- **30th Jun, 2021** No of Weeks:- 15
Week	**Class Day**	**Theory/ Practical Topics**
	1st	1. 1D.C Generator, Explain principle of operation
	2nd	1. 2 Explain Constructional feature
1st	3rd	1.3 Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch
	4th	1.4.1 Simple Lap winding (problems on winding diagram)
	1st	1.4.2 Simple wave winding (problems on winding diagram)
	2nd	1.5.1 Explain Different types of D.C. machines Shunt, Series and Compound machine with problem solving methods.
2nd	3rd	1.5.2 Explain Different types of D.C. machines Shunt, Series and Compound machine with problem solving methods.
	4th	1.6. Derive EMF equation of DC generators. (Solve problems)
	1st	1.7. Explain Armature reaction in D.C. machine & commutation.
	2nd	1.8. Explain Methods of improving commutation (Resistance and emf commutatio
3rd	3rd	1.9. Explain role of inter poles and compensating winding. (solve problems)
	4th	1.10. Characteristics of D.C. Generators with problem solving methods1.11. State application of different types of D.C. Generators.
	1st	1.12. Concept of critical resistance causes of failure of development of emf.
	2nd	1.13. Explain losses and efficiency of D.C. machines, condition for maximum efficiency and numerical problems.
4th	3rd	1.14. Explain parallel operation of D.C. Generators.
	4th	Tutorial
	5th	2.1 Explain basic working principle of DC motor
	1st	2.2 State Significance of back emf in D.C. Motor.
	2nd	2.3 Derive voltage equation of Motor
5th	3rd	2.4 Derive torque (Equation of Armature Torque and shaft Torque) (solve problems)
	4th	Tutorial
	5th	2.5.1 Explain performance characteristics of shunt, series and compound motors and their application. (Solve problems)
	1st	2.5.2 Explain performance characteristics of shunt, series and compound motors and their application. (Solve problems)
6th	2nd	2.6.1 Explain methods of starting shunt, series and compound motors
	3rd	2.6.1 Explain methods of starting shunt, series and compound motors, (solve problems)
	4th	2.7 Explain speed control of D.C shunt motors by 2.7.1 Flux control method
	1st	2.7.2 Armature voltage (rheostatic) Control method.
	2nd	2.7.3 Solve problems
7th	3rd	Tutorial
	4th	2.8 Explain speed control of series motors by Flux control method and series parallel method.
	5st	2.9 Explain determination of efficiency of D.C. Machine by break test method.
	1st	2.10 Explain determination of efficiency of D.C. Machine by Swinburne's Test method.
8th	2nd	2.11.1 Explain Losses & efficiency and condition for maximum power and solve numerical problems.
	3rd	2.11.2 Explain Losses & efficiency and condition for maximum power and solve numerical problems.
	4th	3.1 Explain working principle of transformer.
9th	1st	3.2 Explains Transformer Construction – Arrangement of core & winding in different types of transformer – Brief ideas about transformer accessories such as conservator, tank, breather explosion vent etc.
	2nd	3.3 Explain types of cooling methods
	3rd	3.4 State the procedures for Care and maintenance
	4th	3.5 Derive EMF equation

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10th	1st	3.6 Ideal transformer voltage transformation ratio
	2nd	3.7 Explain Transformer on no load and on load phasor diagrams. 3.8 Explain Equivalent Resistance. Reactance and Impedance.
	3rd	3.9 Explain phasor diagram of transformer with winding Resistance and Magnetic leakage. Phasor diagram on load using upf, leading pf and lagging pf.
	4th	3.10 Explain Equivalent circuit and solve numerical problems.
11th	1st	3.11 Calculate Approximate & exact voltage drop of a Transformer.
	2nd	3.12 Calculate Regulation of various loads and power factor.
	3rd	3.13 Explain Different types of losses in a Transformer. (solve problems)
	4th	3.14 Explain Open circuit test
12th	1st	3.15 Explain Short circuit test
	2nd	3.16 Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
	3rd	3.17 Explain All Day Efficiency (solve problems)
	4th	3.18 Explain determination of load corresponding to Maximum efficiency.
13th	1st	3.19 Explain parallel operation of single phase transformer.
	2nd	Tutorial
	3rd	4.1 Explain constructional features of Auto transformer
	4th	4.2 Explain Working principle of single phase Auto Transformer.
	5st	4.3 State Comparison of Auto transformer with an two winding transformer (saving of Copper)
14th	1st	4.4 State Uses of Auto transformer.
	2nd	4.5 Explain Tap changer with transformer (on load and off load condition)
	3rd	THREE PHASE TRANSFORMER 5.1 State and show Type of connection – Star-Star, Star-Delta, Delta-Star and Delta – Delta.
	4th	5.1.2 State and show Type of connection – Star-Star, Star-Delta, Delta-Star and Delta – Delta.
15th	1st	5.2 Explain parallel operation and state conditions for Parallel operation.
	2nd	5.3 Maintenance schedule of power transformer.
	3rd	Tutorial