

LESSON PLAN

DEPARTMENT OF ELECTRICAL ENGINEERING, ITT, CHOUDWAR

SUBJECT: ENERGY CONVERSION-I **Periods: 4+1 per week**

SEMESTER: 4TH

NAME OF FACULTY: MONALISA SWAIN

No. of weeks: 15

Week	Period	Theory / Practical Topics
1 st	1 st	1.D.C GENERATOR- Operating principle of generator
	2 nd	Constructional features of DC machine, Yoke, Pole & field winding, Armature, Commutator
	3 rd	Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch
	4 th	Simple Lap and wave winding, Dummy coils
	5 th	Tutorial
2 nd	1 st	Different types of D.C. machines (Shunt, Series and Compound)
	2 nd	Derivation of EMF equation of DC generators. (Solve problems)
	3 rd	numerical problems.
	4 th	Losses and efficiency of DC generator. Condition for maximum efficiency and numerical problems
	5 th	Tutorial
3 rd	1 st	Numerical problems.
	2 nd	Armature reaction in D.C. machine
	3 rd	Commutation and methods of improving commutation.
	4 th	Role of inter poles and compensating winding in commutation.
	5 th	Tutorial
4 th	1 st	Characteristics of D.C. Generators
	2 nd	Application of different types of D.C. Generators. Concept of critical resistance and critical speed of DC shunt generator
	3 rd	Conditions of Build-up of emf of DC generator, Uses of D.C generators
	4 th	Parallel operation of D.C. Generators
	5 th	Tutorial
5 th	1 st	numerical problems.
	2 nd	2.D. C. MOTORS Basic working principle of DC motor
	3 rd	Significance of back emf in D.C. Motor., Voltage equation of D.C. Motor
	4 th	condition for maximum power output(simple problems)
	5 th	Tutorial
6 th	1 st	Derive torque equation (solve problems)
	2 nd	Solve more problems
	3 rd	Characteristics of shunt, series and compound motors and their application
	4 th	Starting method of shunt, series and compound motors
	5 th	Tutorial
7 th	1 st	Speed control of D.C shunt motors by Flux control method. Armature voltage Control method. Solve problems
	2 nd	Speed control of D.C. series motors by Field Flux control method, Tapped field method and series-parallel method
	3 rd	Determination of efficiency of D.C. Machine by Brake test method(solve numerical problems)

	4 th	Determination of efficiency of D.C. Machine by Swinburne's Test method(solve numerical problems)
	5 th	Tutorial
8 th	1 st	Losses, efficiency and power stages of D.C. motor, Uses of D.C. motors
	2 nd	solve numerical problems
	3 rd	solve more numerical problems
	4 th	Solve more numerical problems
	5 th	Tutorial
9 th	1 st	3.SINGLE PHASE TRANSFORMER - Working principle of transformer,
	2 nd	Constructional feature of Transformer, Arrangement of core & winding in different types of transformer.
	3 rd	Brief ideas about transformer accessories such as conservator, tank, breather, and explosion vent etc , Explain types of cooling methods
	4 th	State the procedures for Care and maintenance , EMF equation of transformer
	5 th	Tutorial
10 th	1 st	Numerical problems
	2 nd	Ideal transformer voltage transformation ratio
	3 rd	Operation of Transformer at no load, on load with phasor diagrams
	4 th	Equivalent Resistance, Leakage Reactance and Impedance of transformer
	5 th	Tutorial
11 th	1 st	To draw phasor diagram of transformer on load, with winding Resistance and Magnetic leakage with using upf, leading pf and lagging pf load
	2 nd	To explain Equivalent circuit and solve numerical problems
	3 rd	Approximate & exact voltage drop calculation of a Transformer
	4 th	Regulation of transformer
	5 th	Tutorial
12 th	1 st	Different types of losses in a Transformer. Explain Open circuit and Short Circuit test
	2 nd	Solve numerical problems
	3 rd	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency
	4 th	Solve numerical problems
	5 th	Tutorial
13 th	1 st	Explain All Day Efficiency (solve problems)
	2 nd	Determination of load corresponding to Maximum efficiency
	3 rd	Parallel operation of single phase transformer.
	4 th	Solve numerical problems
	5 th	Tutorial
14 th	1 st	Solve numerical problems
	2 nd	4.AUTO TRANSFORMER- Constructional features of Auto transformer, Working principle of single phase Auto Transformer
	3 rd	Comparison of Auto transformer with an two winding transformer (saving of Copper).

	4 th	Uses of Auto transformer, Solve numerical problems
	5 th	Tutorial
15 th	1 st	Explain Tap changer with transformer (on load and off load condition)
	2 nd	4. INSTRUMENT TRANSFORMERS- Explain Current Transformer and Potential Transformer
	3 rd	Define Ratio error, Phase angle error, Burden
	4 th	Uses of C.T. and P.T
	5 th	Tutorial

Teaching Faculty