



ACADEMIC LESSON PLAN FOR SUMMER SEMESTER - 2021-2022 .

Deptt. of Electrical Engg, Govt. Polytechnic , Balasore.

Name of the Faculty : Er. Biswajit Mallik, Sr. Lect

ENERGY CONVERSION-I

Course Code : Th-1

Theory : 5 P/W

Total Period s: 75 P/ Sem

Examination : 3 Hours

Seme : 4TH EE

Class Test : 20 Marks

End Semester Exam : 80marks

TOTAL MARKS : 100 Marks

WEEK	PERIOD	TOPIC
1st	1 st	Introduction to electrical machine D.C Generator
	2 nd	Explain principle of operation Explain Constructional feature
	3 rd	Armature winding, back pitch, Front pitch, Resultant pitch and commutator- pitch.
	4 th	Simple Lap and wave winding (problems on winding diagram)
	5 th	Explain Different types of D.C. machines i.e. Shunt, Series machine with problem solving methods.
2 nd	1 st	Explain Different types of D.C. machines i.e. Compound machine with problem solving methods.
	2 nd	Derive EMF equation of DC generators. (Solve problems)
	3 rd	Explain Armature reaction in D.C. machine.
	4 th	Explain commutation in D.C. machine.
	5 th	Explain Methods of improving commutation (Resistance and emf commutation)
3 rd	1 st	Explain role of inter poles and compensating winding. (solve problems)
	2 nd	Characteristics of D.C. Generators with problem solving methods
	3 rd	Characteristics of D.C. Generators with problem solving methods
	4 th	State application of different types of D.C. Generators.
	5 th	Concept of critical resistance causes of failure of development of emf.
4 th	1 st	Explain losses of D.C. machines & numerical problems.
	2 nd	Explain efficiency of D.C. machines, condition for maximum efficiency and numerical problems.
	3 rd	Explain parallel operation of D.C. Generators.
	4 th	Explain parallel operation of D.C. Generators.
	5 th	Introduction to D. C. MOTORS

5 th	1 st	Explain basic working principle of DC motor
	2 nd	State Significance of back emf in D.C. Motor.
	3 rd	Derive voltage equation of Motor
	4 th	Derive torque (Equation of Armature Torque and shaft Torque) (solve problems)
	5 th	Explain performance characteristics of shunt motors and their application. (Solve problems)
6 th	1 st	Explain performance characteristics of series motors and their application. (Solve problems)
	2 nd	Explain performance characteristics of compound motors and their application. (Solve problems)
	3 rd	Explain methods of starting shunt, series and compound motors, (solve problems)
	4 th	Solve problems on dc motors.
	5 th	Explain speed control of D.C shunt motors by Flux control method
7 th	1 st	Armature voltage (rheostatic) Control method.
	2 nd	Solve problems on speed control of D.C shunt motors .
	3 rd	Explain speed control of series motors by Flux control method.
	4 th	Explain speed control of series motors by series parallel method.
	5 th	Explain determination of efficiency of D.C. Machine by break test method.
8 th	1 st	Explain determination of efficiency of D.C. Machine by Swinburne's Test method.
	2 nd	Explain Losses & efficiency
	3 rd	Explain condition for maximum power.
	4 th	solve numerical problems on losses,efficiency and maximum power.
	5 th	SINGLE PHASE TRANSFORMER Explain working principle of transformer.
9 th	1 st	Explains Transformer Construction – Arrangement of core & winding in different types of transformer
	2 nd	Brief ideas about transformer accessories such as conservator, tank, breather explosion vent etc.
	3 rd	Explain types of cooling methods
	4 th	State the procedures for Care and maintenance
	5 th	Derive EMF equation
10 th	1 st	Ideal transformer voltage transformation ratio
	2 nd	Explain Transformer on no load and on load phasor diagrams.
	3 rd	Explain phasor diagram of transformer with winding Resistance and Magnetic leakage. Phasor diagram on load using upf, leading pf and lagging pf.
	4 th	Explain Equivalent circuit and solve numerical problems.
	5 th	Calculate Approximate & exact voltage drop of a Transformer.

11 th	1 st	Calculate Regulation of various loads and power factor.
	2 nd	Explain Different types of losses in a Transformer.
	3 rd	Solve problems on losses of transformer.
	4 th	Explain Open circuit test.
	5 th	Explain Short circuit test.
12 th	1 st	Explain Efficiency, efficiency at different loads and power factors, condition for maximum efficiency (solve problems)
	2 nd	Explain All Day Efficiency
	3 rd	Solve problems on all day efficiency.
	4 th	Explain determination of load corresponding to Maximum efficiency.
	5 th	Explain parallel operation of single phase transformer
13 th	1 st	AUTO TRANSFORMER Explain constructional features
	2 nd	Explain Working principle of single phase Auto Transformer.
	3 rd	State Comparison of Auto transformer with an two winding transformer (saving of Copper)
	4 th	State Comparison of Auto transformer with an two winding transformer (saving of Copper)
	5 th	State Uses of Auto transformer.
14 th	1 st	Explain Tap changer with transformer (on load and off load condition)
	2 nd	INSTRUMENT TRANSFORMERS Explain Current Transformer
	3 rd	Potential Transformer
	4 th	Define Ratio error, Phase angle error, Burden
	5 th	Define Ratio error, Phase angle error, Burden
15 th	1 st	Uses of C.T. and P.T.
	2 nd	Tutorial
	3 rd	Tutorial
	4 th	Tutorial
	5 th	Tutorial