LESSON PLAN

Discipline: Elect. Engg.	**Semester:** Fourth(4^{th})	**Name of the Faculty:** Er T K Swain
Subject: Energy Conversion-I	**No. of days per Week class allotted: S**ix (6)	**Semester from Date:** 14.02.23 **to Date:** 23.05.23 **No. of Weeks:** 15
WEEK	**CLASS DAY**	**THEORY TOPICS**
1^{st}	1^{st}	**Ch-01-(D.C.Generator)** : Operation Principle of generator Constructional features of D.C machine
	2^{nd}	Yoke, pole & field winding, Armature, Commutator
	3^{rd}	Armature winding, Back, Front, Resultant & Commutator pitch
	4^{th}	Simple Lap & wave winding ,Dummy Coils.
	5^{th}	Derive E.M.F equation of a d.c. generator (Solve problems)
	6^{th}	Different Types of D.C M/C a. Self-Excited with ckt. Diagram with voltage equation
2^{nd}	1^{st}	b. Separately Excited (Shunt & Series) with ckt. Diagram & equations. C. Separately Excited (Long, short shunt & also the cumulative & differential compound M/C) with Ckt. Diagram & equations.
	2^{nd}	Numerical Problems
	3^{rd}	Explanation of Armature reaction in D.C M/C &It's remedies.
	4^{th}	Commutation and methods of improving commutation a (Resistance Commutation))
	5^{th}	b. (Voltage Commutation) Explanation of Inter poles & Compensating windings
	6^{th}	Characteristics Applications of D.C Generators: Internal Characteristic/OCC/LCC of shunt Generator & Application Internal Characteristic/OCC/LCC of Series Generator & Application
	1^{st}	c. Internal Characteristic/OCC/LCC of Compound Generator& Application

3rd	2nd	Voltage built up & Critical resistance of a D.C shunt generator
	3rd	Losses and efficiency in a d.c generator
	4th	Power Stage diagram, Efficiency & condition for max Efficiency.
	5th	Numerical problems
	6th	Numerical problems
4th	1st	Parallel operation of D.C. Generators.
	2nd	Definition of Parallel operation & it's condition Parallel operation of D.C. Shunt generator
	3rd	Parallel operation of D.C. Series generator
	4th	Numerical problems
	5th	Application of different types of D.C Generators, Uses of D.C generators
	6th	**Possible question answer discussion**
5th	1st	**Monthly test-01**
	2nd	**Ch-02-(D.C.Motor)** : Basic working Principle of D.C. Motor
	3rd	Significance of back EMF, symbol, ckt diagram & voltage equation
	4th	Voltage Equation of Motor & Condition for maximum power developed.
	5th	Types of D.C Motor Definition,Ckt diagram & voltage equation of separately excited & shunt & series motor b. Definition,Ckt diagram & voltage equation of compound motor
	6th	Derive Torque equation of D.C Motor (Gross & shaft torque)
6th	1st	Numerical problems
	2nd	Characteristics of D.C. shunt Motors & Applications: a.Speed current Characteristic b.Torque –Current Characteristic c.Speed –Torque characteristic
	3rd	Characteristics of D.C. Series Motors & Applications: a.Speed current Characteristic b.Torque –Current Characteristic c.Speed –Torque characteristic

	4th	Characteristics of D.C. Compound Motors &Applications: (a).Speed current Characteristic (b).Torque –Current Characteristic (c). Speed –Torque characteristic
	5th	Numerical problems
	6th	Methods of starting of D.C. Motors (introduction) a.3-point starter for starting shunt motor
7th	1st	b.4-point starter for starting compound motor
	2nd	**Monthly test-02**
	3rd	Speed Control Of D.C Motors a. Speed Control of d.c. Shunt Motor by flux & armature control method
	4th	Numerical problems
	5th	b. Speed Control Of D.C series Motor by flux control, Tapped field & series -parallel method
	6th	Determination of efficiency of ad.c. Motor by break test method
8th	1st	Determination of efficiency of a d.c. Motor by Swinburne's test method
	2nd	Numerical problems
	3rd	Losses & power stage diagram of D.C. Motor
	4th	uses of d.c motors. & Numerical problems
	5th	**Possible question answer discussion**
	6th	**Ch-03-(Single phase Transformer)** : Introduction, Definition & working principle
9th	1st	Constructional details: Different parts such as core, windings.
	2nd	conservator, tank breather etc.
	3rd	Types of transformers
	4th	Explain types of cooling methods State the procedure for care &Maintenance
	5th	Derivation of EMF equation
	6th	Voltage transformation ratio of an ideal T/F

10th	1st	Explanation of an ideal T/F on no load with phasor diagram
	2nd	Numerical problems
	3rd	**Monthly test-03**
	4th	Phasor diagram of an Ideal T/F on load (UPF, Lagging & leading P.F)
	5th	Explanation of equivalent resistance, reactance & impedance
	6th	Phasor diagram of practical T/F with winding resistance &magnetic leakage foru.p.f,lagging & leading p.f.
11th	1st	Equivalent circuit diagram
	2nd	Derivation of approximate & exact voltage drop of a T/F
	3rd	Calculation of voltage regulation at different power factors
	4th	Losses & efficiency of a 1-ph T/F
	5th	Open circuit test & S.C test of a 1-ph T/F
	6th	condition for maximum of 1-ph T/F & load corresponding to max efficiency.
12th	1st	Numerical problems
	2nd	Explanation of all day efficiency
	3rd	Formula for o/p power & losses & numerical problems
	4th	Parallel operation of 1-ph T/F
	5th	**Possible question answer discussion**
	6th	**Ch-04-(Auto Transformer)** Constructional feature auto transformer,
	1st	Working principle of an auto transformer,
	2nd	Saving of copper in an auto T/F
	3rd	**Monthly test-04**

13th	4th	Uses of an Auto T/F
	5th	On-Load Tap changer of the T/F
	6th	Off-Load Tap changer of the T/F
14th	1st	**Possible question answer discussion**
	2nd	**Ch-05-(Instrument Transformer)** Definition, Construction of CT,PT & Ratio Error
	3rd	Phase angle Error & Burden.
	4th	Uses of CT & PT
	5th	**Possible question answer discussion**
	6th	Revision
15th	1st	Revision
	2nd	Revision
	3rd	Revision
	4th	Revision
	5th	Revision
	6th	Revision

Syllabus Coverage up to Inter assessment – Chapter-01 & 02.