ENERGY CONVERSION-I (Th-01)

Date of Commencement of classes: 14.02.2023 Date of Closing of classes: 23.05.2023

LIST OF WEEK/ MONTH WISE AVAILABLE DAYS/ PERIODS

Sl. No.	Month	Week-wise no. of academic days available					Total no. of academic days
		Week- 1	Week- 2	Week- 3	Week- 4	Week- 5	
1	February	--	--	4	6	3	13
2	March	2	5	4	4	6	21
3	April	5	4	4	5	2	20
4	May	3	6	5	--	--	14
Total		**10**	**15**	**12**	**15**	**11**	**68**

NO. OF AVAILABLE CLASSES PER WEEK/ MONTH

Sl. No.	Month	Week-wise no. of academic periods available					Total no. of academic periods
		Week- 1	Week- 2	Week- 3	Week- 4	Week- 5	
1	February	--	--	4	6	3	13
2	March	2	5	4	4	6	21
3	April	5	4	4	5	2	20
4	May	3	6	5	--	--	14
Total		**10**	**15**	**12**	**15**	**11**	**68**

CHAPTER-WISE DISTRIBUTION OF PERIODS

Sl. No.	Name of the Chapter	Periods as per Syllabus	Required periods	Expected Marks
01	**DC. GENERATORS**	17	22	30
02	**D.C.MOTORS**	15	20	25
03	**SINGLE PHASE TRANSFORMER**	20	17	25
04	**AUTO TRANSFORMER**	03	02	10
05	**INSTRUMENT TRANSFORMERS**	05	02	10
	TOTAL	**60**	**63**	100

LESSON PLAN

Name of the Month	Week No.	Class day	Art. No.	NAME OF THE FACULTY –PRANAY ROUT Theory Topics
FEBRUARY	3rd	1st	1.1 1.2 1.2.1	**Chapter-01 (D.C Generator)** Operation Principle of generator Constructional features of D.C machine (Fig. detection of parts)
		2nd	1.2.1	Detection of rest of parts of the d.c generator
		3rd	1.2.2	Armature winding, Back, Front, Resultant &Commutator pitch
		4th	1.2.3	Simple Lap & wave winding with their properties.
	4th	1st	1.4	Derive E.M.F equation of a d.c. generator (Solve problems)
		1st	1.3	Different Types of D.C M/C a. Self-Excited with ckt. Diagram with voltage equation
		2nd		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.
		3rd		Numerical Problems
		4th	1.6	Explanation of Armature reaction in D.C M/C & It's remedies.
		5th	1.7	Commutation and methods of improving commutation a (Resistance Commutation))
		6th	1.7.1	b. (Voltage Commutation) Explanation of Inter poles & Compensating windings
	5th	1st	1.8	Characteristics Applications of D.C Generators: a. Internal Characteristic/OCC/LCC of shunt Generator & Application b. Internal Characteristic/OCC/LCC of Series Generator & Application
		2nd		c. Internal Characteristic/OCC/LCC of Compound Generator & Application
		3rd	1.10 1.11	Voltage built up & Critical resistance of a D.C shunt generator
	1st	1st	1.5	Losses and efficiency in a d.c generator
		2nd		Power Stage diagram, Efficiency & condition for max Efficiency.
	2nd	1st		Numerical problems
		2nd		Numerical problems
		3rd	1.12	Parallel operation of D.C. Generators.
		4th		a. Definition of Parallel operation & it's condition b. Parallel operation of D.C. Shunt generator
		5th		**c.** Parallel operation of D.C. Series generator **d.**
	3rd	1st		Numerical problems
		2nd	1.9 1.13	Application of different types of D.C Generators, Uses of D.C generators

M A R C H		3rd	2.1	**Chapter-02 (D. C. MOTORS)** Principle of D.C. Motor
		4th	2.2	Significance of back EMF, symbol, ckt diagram & voltage equation
	4th	1st	2.3	Voltage Equation of Motor & Condition for maximum power developed.
		2nd	2.6	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
		3rd	2.4	Torque equation of D.C Motor (Gross & shaft torque)
		4th		Numerical problems
	5th	1st	2.5	Characteristics of D.C. shunt Motors & Applications: a. Speed current Characteristic b. Torque –Current Characteristic c. Speed –Torque characteristic
		2nd		Characteristics of D.C. Series Motors & Applications: a. Speed current Characteristic b. Torque –Current Characteristic c. Speed –Torque characteristic
		3rd		Characteristics of D.C. Compound Motors& Applications: a. Speed current Characteristic b. Torque –Current Characteristic c. Speed –Torque characteristic
		4th		Numerical problems
		5th	2.6	Methods of starting of D.C. Motors (introduction) a.3-point starter for starting shunt motor
		6th		b.4-point starter for starting compound motor
A P R I L	1st	1st	2.7	Speed Control Of D.C Motors a. Speed Control of d.c. Shunt Motor by flux & armature control method
		2nd		Numerical problems
		3rd	2.8	b. Speed Control Of D.C series Motor by flux control, Tapped field & series -parallel method
		4th	2.9	Determination of efficiency of a d.c. Motor by break test method
		5th	2.10	Determination of efficiency of a d.c. Motor by Swinburne's test method
	2nd	1st		Numerical problems
		2nd	2.11	Losses & power stage diagram of D.C. Motor
		3rd	2.12	uses of d.c motors. & Numerical problems

		4th	3.1	**Chapter-03(Single Phase Transformer)** Introduction, Definition & working principle
			3.2 3.2.1	Constructional details: Different parts such as core, windings.
	3rd	1st	3.2.2	conservator, tank breather etc.
			3.2.3	Types of transformers
		2nd	3.3	Explain types of cooling methods State the procedure for care &Maintenance
		3rd	3.4	Derivation of EMF equation
			3.5	Voltage transformation ratio of an ideal T/F
		4th		Explanation of an ideal T/F on no load with phasor diagram
	4th	1st		Numerical problems
		2nd	3.6	Phasor diagram of an Ideal T/F on load (UPF, Lagging & leading P.F)
		3rd	3.7	Explanation of equivalent resistance, reactance & impedance
		4th	3.8	Phasor diagram of practical T/F with winding resistance & magnetic leakage for u.p.f, lagging & leading p.f.
		5th	3.9	Equivalent circuit diagram
			3.10	Derivation of approximate & exact voltage drop of a T/F
	5th	1st	3.11	Calculation of voltage regulation at different power factors
			3.12	Losses & efficiency of a 1-ph T/F
		2nd	3.13	Open circuit test & S.C test of a 1-ph T/F
M A Y	1st	1st	3.15	condition for maximum of 1-ph T/F & load corresponding to max efficiency.
		2nd		Numerical problems
		3rd	3.14	Explanation of all day efficiency
	2nd	1st		Formula for o/p power & losses & numerical problems
		2nd	3.16	Parallel operation of 1-ph T/F
		3rd	4.1	**Chapter-04 (Auto Transformer)** Constructional feature auto transformer,
			4.2	Working principle of an auto transformer,
			4.3	Saving of copper in an auto T/F
		4th	4.4	Applications of an Auto T/F
			4.5	On-Load Tap changer of the T/F
				Off-Load Tap changer of the T/F
		5th	5.1	**Chapter-05 (Instrument Transformers)** Definition, Construction of CT, PT & Ratio Error
		6th	5.2	Phase angle Error & Burden.
			5.3	Application of CT & PT

Coverage of Chapters up to the internal assessment (2nd week of May 2022)**: 1-5**

Learning Resources:

Sl. No.	Name of the Book	Author Name	Publisher
01	Electrical technology vol-II	B.L.Thereja & A.K.Thereja	S.Chand
02	Electrical machine	V.K .Meheta	
03	Electrical technology	J.B.Gupta	