Name of Faculty :Prankit Gupta
Discipline :Electrical Engineering
Semester :III
Subject :Electrical Machine-I
Lesson Plan Duration :15 weeks
Work Load (Lecture/Practical) Hours :Lecture-03, Practical-04

Week	Theory		Practical	
	Lecturer Day	Topic(including assignment/test)	Practical Day	Topic
1	1	Discuss Learning outcomes of Electrical Machine subject.	1	Measurement of the angular displacement of the rotor of a slip-ring induction motor on application of DC to stator of motor winding in sequence and simultaneously to each
	2	**Unit1 DC Generators:** Introduction to Electrical Machines: Definition of motor and generator,		
	3	Torque development due to alignment of two fields and the concept of torque angle,	2	File checking and viva
2	4	Generalized theory of electrical machines.	3	Speed control of DC shunt motor (i) Armature control method (ii) Field control method
	5	DC generator: construction, parts, materials and their functions.		
	6	Principle of operation of DC generator, e.m.f. equation of generator,	4	File checking and viva
3	7	armature reaction, commutation	5	Study of DC series motor with starter (to operate the motor on no load for a moment)
	8	Various types of DC generator, Applications of DC generators.		
	9	**Unit2 DC Motors:** Types of DC motors, Principle of operation,	6	File checking and viva
4	10	characteristics, Back e.m.f. and its significance, Voltage equation of DC motor.	7	Determine efficiency of DC motor by Swinburne's Test at (i) rated capacity (ii) half full load
	11	Torque and Speed; Armature torque, Shaft torque, BHP,		
	12	losses, efficiency, Electric Braking. Applications of DC motors.	8	File checking and viva

5	13	DC motor starters: Necessity, three point and four point starters.	9	To perform open circuit and short circuit test for determining: (i) equivalent circuit (ii) the regulation and (iii) efficiency of a transformer from the data obtained from open circuit and short circuit test at full load
	14	Speed control of DC shunt and series motor: Flux and Armature control.		
	15	Determination of losses by Swinburne's test.	10	File checking and viva
6	16	Brushless DC Motor: Construction and working,	11	To find the efficiency and regulation of single phase transformer by actually loading it.
	17	rating and specifications of DC machines		
	18	First assignment will be given and tentative 1st sessional test/evaluation of sessional marks etc	12	File checking and viva
7	19	Display and analysis of 1st sessional marks	13	Checking the polarity of the windings of a three phase transformer and connecting the windings in various configurations
	20	**Unit3 Single Phase Transformers:** Introduction, Types of transformers: Shell type and core type;		
	21	Construction: Parts and functions, materials used for different parts;	14	File checking and viva
8	22	Principle of operation,	15	Finding the voltage and current relationships of primary and secondary of a three phase transformer under balanced load in various configurations conditions such as (a) Star-star (b) Star-delta (c) Delta-star (d) Delta - Delta configuring conditions.
	23	EMF equation of transformer: Derivation, Voltage transformation ratio.		
	24	Transformer No-load and on-load phasor diagram.	16	File checking and viva
9	25	Mutual and leakage fluxes, Leakage reactance.	17	Evaluation of practicals
	26	Equivalent circuit of transformer: Equivalent resistance and reactance.		
	27	Voltage regulation and Efficiency.	18	Viva
	28	Open circuit and short circuit tests , all day efficiency.	19	Evaluation of practicals
	29	Rating and Specifications of single phase transformer.		

10	30	**Unit4 Three Phase Transformers:** Construction of three phase transformers accessories of transformers such as Conservator, breather, Buchholtz Relay, Tap Changer (off load and on load)	20	Viva
11	31	Second assignment will be given and tentative 2nd sessional test/evaluation of sessional marks etc	21	Evaluation of practicals
	32	Display and analysis of 2nd sessional marks		
	33	Types of three phase transformer i.e. delta-delta, delta-star, star-delta and star-star.	22	Viva
12	34	Need of parallel operation of three phase transformer, Conditions for parallel operation. Polarity tests.	23	Revision of practicals
	35	Criteria for selection of distribution transformer, and power transformer,Amorphous Core type Distribution Transformer.		
	36	Cooling of transformer. Specifications of three-phase distribution transformers.	24	Quiz based assesment
13	37	**Unit5:** Single phase and three phase auto transformers: Construction, working and applications.	25	Revision of practicals
	38	Instrument Transformers: Construction, working and applications of Current transformer and Potential transformer.		
	39	Isolation transformer: Constructional Features and applications.	26	Quiz based assesment
14	40	Single phase welding transformer: constructional features and applications.	27	Revision of practicals
	41	'K' factor of transformers: overheating due to non-linear loads and harmonics.		
	42	3rd sessional	28	Quiz based assesment
15	43	Evaluation and display of 3rd sessional marks	29	viva voce/ preparation of practical sessional marks
	44	Remedial will be taken if any shortcomings found		
	45	Remedial will be taken if any shortcomings found	30	viva voce/ preparation of practical sessional marks