

Name of the Faculty: Anand yadav

Discipline : Electrical Engineering

Semester : 4th

Subject : Electrical Machines-II

Duration : 15 weeks(from 20 January 2025 to 02 May 2025)

Work load (Lecture/Practical) per week (in Hours):Lecture-03,Practical -04

Week	Day	Topic	Practical
1	1	Introduction Of The Subject, Its Need, Applications	1. To Plot relationship between no load terminal voltage and excitation current in a synchronous generator at constant speed
	2	Synchronous Machines	
	3	1.1 Main constructional features of synchronous machine including commutator	
2	4	1.2 Generation of three phase emf	2. Determination of the relationship between the terminal voltage and load current of an alternator, keeping excitation and speed constant.
	5	1.3 Production of rotating magnetic field in a three phase winding	
	6	1.4 E.M.F. Equation, Concept of distribution factor and coil span factor	
3	7	1.5 Operation of single synchronous machine independently supplying a load, voltage regulation by synchronous impedance method	3. Determination of the efficiency of alternator from the open circuit and short circuit test.
	8	1.6 Need and necessary conditions of parallel operation of alternators, synchronizing an alternator (Synchroscope method) with the bus bars	
	9	1.7 Operation of synchronous machine as motor, Starting methods of Synchronous Motor	
4	10	1.8 Concept and Cause of hunting and its prevention	4. Parallel operation of three phase alternators.
	11	1.9 Specification of Synchronous Machine	
	12	1.10 Cooling of synchronous machines	
5	13	1.11 Application of synchronous machines (as a synchronous condenser)	5. Study of ISI/BIS code for 3-phase induction motors.
	14	Assignment No 01	
	15	Test No.01	
6	16	Three Phase Induction Motors 2.13 Cogging and Crawling in Induction Motors.	6. Perform at least two tests on a 3-phase induction motor as per BIS code.
	17	2.1 Salient constructional features of 3 phase squirrel cage and slip ring induction motors	
	18	2.2 Principle of operation, slip and its significance	

7	19	2.3 Locking of rotor and stator fields	7. To reverse the direction of rotation of three phase induction motor.
	20	2.4 Rotor resistance, inductance, e.m.f. and current	
	21	2.5 Relationship between copper loss and the motor slip	
8	22	2.6 Power flow diagram of an induction motor	8. To control speed of three phase induction motor.
	23	2.7 Factors determining the torque	
	24	2.8 Torque-slip curve, stable and unstable zones	
9	25	2.9 Effect of rotor resistance upon the torque slip relationship	9. Determination of efficiency of three phase induction motor by (a) No load test and blocked rotor test. (b) Direct loading (refer BIS code).
	26	2.10 Starting of 3-phase induction motors by DOL, star-delta and auto transformer starter	
	27	2.11 Causes of low power factor of induction motors	
10	28	2.12 Speed control of induction motor	10. Determination of effect of rotor resistance on torque speed curve of an induction motor.
	29	Assignment No 02	
	30	Test No.02	
11	31	Single Phase Induction Motors:	
	32	3.1 Single phase induction motors; Construction characteristics and applications	11. To Plot Torque-Slip Characteristics of three phase induction Motor.
	33	3.2 Nature of field produced in single phase induction motor	
12	34	3.3 Split phase induction motor: Capacitors start and run motor, Shaded pole motor and Reluctance start motor	12. Study of performance of a ceiling fan with and without capacitor
	35	3.4 Alternating current series motor and universal motors	
	36	Assignment No.03	
13	37	Special Purpose Machines	13. Study the effect of change in capacitor on the performance of single phase induction motor
	38	4.1 Working principle of Linear induction motor, Stepper motor and Servomotor	
	39	4.2 Introduction to Energy efficient Motors.	
14	40	Test No. 03	.
	41	Revision of Unit I	14. To reverse the direction of rotation of single phase induction motor
	42	Revision of Unit II	
15	43	Revision of Unit III	
	44	Revision of Unit IV	File Checking and Viva
	45	Previous HSBTE Exam Papers Solved	File Checking and Viva