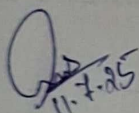


LESSON PLAN

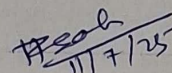
Discipline: ELECTRICAL	Semester: 5 TH	Name Of The Teaching Faculty: SUDIPTA KUMAR DAS	
Subject: EC-II (Th2)	No. Of Days Per Week: Class Allotted: 5P	Semester From Date: 14.07.2025 To Date: 15.11.2025	No. of weeks: 15
Week	Class Day	Theory Topic	
1 ST week	1 st	1. ALTERNATOR: 1.1. Types of alternator and their constructional features.	
	2 nd	1.2. Basic working principle of alternator and the relation between speed and frequency.	
	3 rd	1.3. Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor).	
	4 th	1.4. Explain harmonics, its causes and impact on winding factor.	
2 nd week	1 st	1.4. Explain harmonics, its causes and impact on winding factor.	
	2 nd	1.5. E.M.F equation of alternator. (Solve numerical problems).	
	3 rd	1.5. E.M.F equation of alternator. (Solve numerical problems).	
	4 th	1.6. Explain Armature reaction and its effect on emf at different power factor of load.	
3 rd week	1 st	1.7. The vector diagram of loaded alternator. (Solve numerical problems)	
	2 nd	1.8. Testing of alternator (Solve numerical problems) 1.8.1. Open circuit test.	
	3 rd	1.8.2. Short circuit test.	
	4 th	1.9. Determination of voltage regulation of Alternator by direct loading and synchronous impedance method. (Solve numerical problems)	
4 TH week	1 st	1.9. Determination of voltage regulation of Alternator by direct loading and Synchronous impedance method. (Solve numerical problems)	
	2 nd	1.10. Parallel operation of alternator using synchro-scope and dark & Bright lamp method.	
	3 rd	1.11. Explain distribution of load by parallel connected alternators.	
	4 th	CLASS TEST	
5 th week	1 st	2. SYNCHRONOUS MOTOR: 2.1. Constructional feature of Synchronous Motor. 2.2. Principles of operation, concept of load angle	
	2 nd	2.2 Principles of operation, concept of load angle	
	3 rd	2.3. Derive torque, power developed.	
	4 th	2.4. Effect of varying load with constant excitation. Effect of varying excitation with constant load.	
6 th week	1 st	2.7. Explain effect of excitation on Armature current and power factor.	
	2 nd	2.8. Hunting in Synchronous Motor. 2.9. Function of Damper Bars in synchronous motor and generator.	
	3 rd	2.10. Describe method of starting of Synchronous motor.	
	4 th	2.11. State application of synchronous motor.	

7 th week	1 st	3. THREE PHASE INDUCTION MOTOR: 3.1. Production of rotating magnetic field.
	2 nd	3.2. Constructional feature of Squirrel cage and Slip ring induction motors.
	3 rd	3.3. Working principles of operation of 3-phase Induction motor.
	4 th	3.4. Define synchronous speed, slip and establish the relation of slip with rotor quantities.
8 th week	1 st	3.5. Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (solve numerical problems)
	2 nd	3.6. Torque-slip characteristics.
	3 rd	3.7. Derive relation between full load torque and starting torque etc. (solve numerical problems)
	4 th	Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems)
9 th week	1 st	3.9. Methods of starting and different types of starters used for three phase Induction motor.
	2 nd	3.10. Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods.
	3 rd	3.10. Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods.
	4 th	3.11. Plugging as applicable to three phase induction motor.
10 th week		3.12. Describe different types of motor enclosures.
	1 st	
	2 nd	3.13. Explain principle of Induction Generator and state its applications.
	3 rd	4. SINGLE PHASE INDUCTION MOTOR:
11 th week		4.1. Introduction and Explain Ferraris principle.
	4 th	4.2. Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor.
	1 st	4.2. Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor.
	2 nd	4.3. Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors. 4.3.1. Split phase motor.
	3 rd	4.3.2. Capacitor Start motor. 4.3.3. Capacitor start, capacitor run motor.
12 th week	4 th	4.3.4. Permanent capacitor type motor. 4.3.5. Shaded pole motor.
	1 st	4.4. Explain the method to change the direction of rotation of above motors.
	2 nd	4.4. Explain the method to change the direction of rotation of above motors.
	3 rd	5. COMMUTATOR MOTORS: 5.1. Construction, working principle, running characteristic and application of single phase series motor.
	4 th	5.1. Construction, working principle, running characteristic and application of single phase series motor.

	1 st	5.2. Construction, working principle and application of Universal motors.
	2 nd	5.2. Construction, working principle and application of Universal motors.
	3 rd	5.3. Working principle of Repulsion start Motor, Repulsion start Inductionrun motor, Repulsion Induction motor.
	4 th	5.3. Working principle of Repulsion start Motor, Repulsion start Inductionrun motor, Repulsion Induction motor.
14 th week	1 st	6. SPECIAL ELECTRICAL MACHINE: 6.1. Principle of Stepper motor. 6.2. Classification of Stepper motor.
	2 nd	6.3. Principle of variable reluctant stepper motor.
	3 rd	6.4. Principle of Permanent magnet stepper motor.
	4 th	6.5. Principle of hybrid stepper motor.
15 th week	1 st	7. THREE PHASE TRANSFORMERS: 7.1. Explain Grouping of winding, Advantages.
	2 nd	7.2. Explain parallel operation of the three phase transformers.
	3 rd	7.2. Explain parallel operation of the three phase transformers.
	4 th	7.3. Explain tap changer (On/Off load tap changing)


11.7.25

SIGN OF FACULTY


11/7/25

SIGN OF SR. LECT.
Head of Dept. (HOD)
Electrical & ETC Engg.
G. E. T (POLY), ...


11/7/25

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