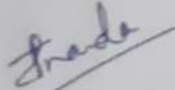


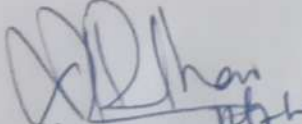
PNS SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING

Branch: Electrical Engg.	Semester: 5 TH	Name of the Lecturer: J Pratul Kumar Nanda
Subject: EC-II	Classes Alloted in a Week: 5	Duration of Semester: 14.07.2025 - 15.11.2025
Week	Class Day	Theory / Practical Topic
1st	1	ALTERNATOR: Types of alternator and their constructional features
	2	Basic working principle of alternator
	3	The relation between speed and frequency
	4	Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor)
	5	Explain harmonics, its causes and impact on winding factor
2nd	1	E.M.F equation of alternator. (Solve numerical problems).
	2	Explain Armature reaction and its effect on emf at different power factor of load
	3	The vector diagram of loaded alternator. (Solve numerical problems)
	4	Testing of alternator (Solve numerical problems): Open circuit test.
	5	Testing of alternator (Solve numerical problems): short circuit test
3rd	1	Determination of voltage regulation of Alternator by direct loading method (Solve numerical problems)
	2	Determination of voltage regulation of Alternator by synchronous impedance method. (Solve numerical problems)
	3	Parallel operation of alternator using synchro-scope and dark & bright lamp method.
	4	Explain distribution of load by parallel connected alternators
	5	SYNCHRONOUS MOTOR: Constructional feature of Synchronous Motor.
4th	1	Principles of operation, concept of load angle
	2	Derive torque, power developed
	3	Effect of varying load with constant excitation and Effect of varying excitation with constant load.
	4	Power angle characteristics of cylindrical rotor motor
	5	Explain effect of excitation on Armature current and power factor and Hunting in Synchronous Motor.
5th	1	Function of Damper Bars in synchronous motor and generator
	2	Describe method of starting of Synchronous motor and State application of synchronous motor.
	3	THREE PHASE INDUCTION MOTOR: Production of rotating magnetic field
	4	Constructional feature of Squirrel cage and Slip ring induction motors.
	5	Working principles of operation of 3-phase Induction motor.
6th	1	Define slip speed, slip and establish the relation of slip with rotor quantities.
	2	Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (solve numerical problems)
	3	Torque-slip characteristics
	4	Derive relation between full load torque and starting torque etc. (solve numerical problems)
	5	Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems)

7th	1	Methods of starting and different types of starters used for three phase Induction motor
	2	Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods.
	3	Plugging as applicable to three phase induction motor
	4	Describe different types of motor enclosures
	5	Explain principle of Induction Generator and state its applications.
8th	1	Solve numerical problems
	2	SINGLE PHASE INDUCTION MOTOR: Explain Ferrari's principle.
	3	Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor
	4	Explain Working principle, Torque speed characteristics, performance characteristics and application of Split phase motor.
	5	Explain Working principle, Torque speed characteristics, performance characteristics and application of Capacitor Start motor
9th	1	Explain Working principle, Torque speed characteristics, performance characteristics and application of Capacitor start, capacitor run motor.
	2	Explain Working principle, Torque speed characteristics, performance characteristics and application of Permanent capacitor type motor.
	3	Explain Working principle, Torque speed characteristics, performance characteristics and application of Shaded pole motor.
	4	Explain the method to change the direction of rotation of above motors
	5	COMMUTATOR MOTORS: Construction, working principle
10th	1	Running characteristic and application of single phase series motor
	2	Construction, working principle and application of Universal motors
	3	Working principle of Repulsion start Motor,
	4	Working principle of Repulsion start Induction run motor
	5	Working principles of Repulsion Induction motor.
11th	1	SPECIAL ELECTRICAL MACHINE: Principle of Stepper motor.
	2	Classification of Stepper motor
	3	Principle of variable reluctant stepper motor
	4	Principle of Permanent magnet stepper motor.
	5	Principle of hybrid stepper motor & Applications of Stepper motor
12th	1	THREE PHASE TRANSFORMERS: Explain Grouping of winding, Advantages.
	2	Explain parallel operation of the three phase transformers.
	3	Explain tap changer (On load tap changing)
	4	Explain tap changer (Off load tap changing)
	5	Maintenance Schedule of Power Transformers.


Signature of the
Lecturer


Signature of the
H.O.D.


Signature of the
Principal