PNS SCHOOL OF ENGINEERING AND TECHNOLOGY		
Branch: Electrical Engineering	Semester: 5TH	Name of the Lecturer: **Jayakanta Mallick**
Subject: EC-II	No of lasses Alloted in a Week: 6	Duration of Semester: 01.08.2023 - 30.11.2023
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
	6	E.M.F equation of alternator. (Solve numerical problems).
2nd	1	Explain Armature reaction and its effect on emf at different power factor of load
	2	The vector diagram of loaded alternator. (Solve numerical problems)
	3	Testing of alternator (Solve numerical problems): Open circuit test.
	4	Testing of alternator (Solve numerical problems):short circuit test
	5	Determination of voltage regulation of Alternator by direct loading method(Solve numerical problems)
	6	Determination of voltage regulation of Alternator by synchronous impedance method. (Solve numerical problems)
3rd	1	Parallel operation of alternator using synchro-scope and dark & bright lamp method.
	2	Explain distribution of load by parallel connected alternators
	3	**SYNCHRONOUS MOTOR:** Constructional feature of Synchronous Motor.
	4	Principles of operation, concept of load angle
	5	Derive torque, power developed
	6	Effect of varying load with constant excitation and Effect of varying excitation with constant load.
4th	1	Power angle characteristics of cylindrical rotor motor
	2	Explain effect of excitation on Armature current and power factor and Hunting in Synchronous Motor.
	3	Function of Damper Bars in synchronous motor and generator
	4	Describe method of starting of Synchronous motor and State application of synchronous motor.
	5	**THREE PHASE INDUCTION MOTOR**:Production of rotating magnetic field
	6	Constructional feature of Squirrel cage and Slip ring induction motors.
5th	1	Working principles of operation of 3-phase Induction motor.
	2	Define slip speed, slip and establish the relation of slip with rotor quantities.
	3	Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (solve numerical problems)
	4	Torque-slip characteristics
	5	Derive relation between full load torque and starting torque etc. (solve numerical problems)
	6	Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems)

6th	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.
	6	Solve numerical problems
7th	1	**SINGLE PHASE INDUCTION MOTOR**: Explain Ferrari's principle.
	2	Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor
	3	Explain Working principle, Torque speed characteristics, performance characteristics and application of Split phase motor.
	4	Explain Working principle, Torque speed characteristics, performance characteristics and application of Capacitor Start motor
	5	Explain Working principle, Torque speed characteristics, performance characteristics and application of Capacitor start, capacitor run motor.
	6	Explain Working principle, Torque speed characteristics, performance characteristics and application of Permanent capacitor type motor.
8th	1	Explain Working principle, Torque speed characteristics, performance characteristics and application of Shaded pole motor.
	2	Explain the method to change the direction of rotation of above motors
	3	**COMMUTATOR MOTORS**: Construction, working principle,
	4	Running characteristic and application of single phase series motor
	5	Construction, working principle and application of Universal motors
	6	Working principle of Repulsion start Motor,
9th	1	Working principle of Repulsion start Induction run motor,
	2	Working principles of Repulsion Induction motor.
	3	**SPECIAL ELECTRICAL MACHINE:** Principle of Stepper motor.
	4	Classification of Stepper motor
	5	Principle of variable reluctant stepper motor
	6	Principle of Permanent magnet stepper motor.
10th	1	Principle of hybrid stepper motor & Applications of Stepper motor
	2	**THREE PHASE TRANSFORMERS:**Explain Grouping of winding, Advantages.
	3	Explain parallel operation of the three phase transformers.
	4	Explain tap changer (On load tap changing)
	5	Explain tap changer (Off load tap changing)
	6	Maintenance Schedule of Power Transformers.

Signature of the
Lecturer

Signature of the
H.O.D.