Department of Electrical Engineering

Branch: Electrical Engineering	Semester: 4TH	Name of the Lecturer: **J Pratul Nanda**	
Subject: ACMSEM	No of classes alloted in a week: 5	Duration of Semester: 22.12.2025 - 18.04.2026	
Week	**Class Day**	**Theory / practical Topic**	
1st	1	**Three Phase Induction Motor:** Working principle,Production of rotating magnetic field, Synchronous speed, rotor speed and slip	
	2	Constructional details of 3 phase induction motors: Squirrel cage induction motor.	
	3	Constructional details of 3 phase induction motors: Slip ring induction motor	
	4	Rotor quantities: frequency, induced emf, power factor at starting and running condition	
	5	Characteristics of torque versus slip (speed), Torques: starting, full load and maximum with relations among them(numericals)	
2nd	1	Induction motor as a generalized transformer with phasor diagram	
	2	Four quadrant operation, Power flow diagram(numericals)	
	3	Starters: need and types; stator resistance, auto transformer, star delta, rotor resistance and soft starters	
	4	Speed control methods: stator voltage, pole changing,Rotor resistance and VVVF.	
	5	Motor selection for different applications as per the load torque-speed requirements. Maintenance of three phase induction motors.	
3rd	1	**Single phase Induction Motors:** Double field revolving theory	
	2	Principle of making single phase induction motors self-start	
	3	Construction and working of single phase induction motors.	
	4	Construction and working of Resistance start induction run motors.	
	5	Construction and working of Capacitor start induction run motors & Capacitor start capacitor run motors.	
4th	1	Construction and working of Shaded pole type motor & Repulsion type motor	
	2	Construction and working of Series motor,Universal motor,Hysteresis motor.	
	3	Torque-speed characteristics for all of the above motors.	
	4	Motor selection for different applications as per the load torque-speed requirements & Maintenance of single phase induction motors.	
	5	**Three phase Alternators:**Principle of working,moving and stationary armatures.	
5th	1	Constructional details: parts and their functions.	
	2	Rotor constructions. Windings: Single and Double layer.	
	3	E.M.F. equation of an Alternator with numerical by considering short pitch factor and distribution factor.	
	4	Alternator loading, Factors affecting the terminal voltage of alternator.	
	5	Armature resistance and leakage reactance drops.	
6th	1	Armature reaction at various power factors and synchronous impedance.	
	2	Voltage regulation: Direct loading Method,Synchronous Impedance Methods.	
	3	Maintenance of alternators	
	4	**Synchronous Motors:** Principle of working /operation.	
	5	Significance of load angle.	
7th	1	Torques: starting torque, running torque, pull in torque, pull out torque.	
	2	Synchronous motor on load with constant excitation (numerical)	
	3	Effect of excitation at constant load (numerical).	
	4	Curves and Inverted V-Curves.	
	5	Hunting & Phase Swinging.	

8th	1	Methods of Starting of Synchronous Motor
	2	Losses in synchronous motors and efficiency & Applications Areas.
	3	**Fractional horse power (FHP) Motors:** Construction & Working
	4	Construction and working of Synchronous Reluctance Motor
	5	Construction and working of Switched Reluctance Motor
9th	1	Construction and working of BLDC Motor
	2	Construction and working of Permanent Magnet Synchronous Motors.
	3	Construction and working of Stepper motors.
	4	Construction and working of AC & DC servomotors.
	5	Torque speed characteristics of above motors & Applications of above motors.

**Signature of the
Lecturer**

**Signature of the
H.O.D.**

**Signature of the
Principal**