GIET POLYTECHNIC, JAGATPUR,

CUTTACK

LESSON PLAN

Discipline: ELECTRICAL	**Semester:**5TH	**Name Of The Teaching Faculty:** DWITIKRUSHNA BEHERA
Subject: EC-II (Th2)	**No. Of Days Per Week Class Allotted:** 5P	**Semester From Date:**01.07.2024 **To Date:** 08.11.2024 **No.ofweeks:**15
Week	Class Day	Theory Topic
1STweek	1st	**1. ALTERNATOR:** 1.1. Types of alternator and their constructional features.
	2nd	1.2. Basic working principle of alternator and the relation between speed andfrequency.
	3rd	.3. Terminology in armature winding and expressions for winding factors(Pitch factor, Distribution factor).
	4th	1.4. Explain harmonics, its causes and impact on winding factor.
2NDweek	1st	1.4. Explain harmonics, its causes and impact on winding factor.
	2nd	1.5. E.M.F equation of alternator. (Solve numerical problems).
	3rd	1.5. E.M.F equation of alternator. (Solve numerical problems).
	4th	1.6. Explain Armature reaction and its effect on emf at differentpower factor of load.
3RDweek	1st	1.7. The vector diagram of loaded alternator. (Solve numerical problems)
	2nd	1.8. Testing of alternator (Solve numerical problems) 1.8.1. Open circuit test.
	3rd	1.8.2. Short circuit test.
	4th	1.9. Determination of voltage regulation of Alternator by direct loading andsynchronous impedance method. (Solve numerical problems)
4TH week	1st	1.9. Determination of voltage regulation of Alternator by direct loading andSynchronous impedance method. (Solve numerical problems)
	2nd	1.10. Parallel operation of alternator using synchro-scope and dark &Brightlamp method.
	3rd	1.11. Explain distribution of load by parallel connected alternators.
	4th	CLASS TEST
5THweek	1st	**2. SYNCHRONOUS MOTOR:** 2.1. Constructional feature of Synchronous Motor. 2.2. Principles of operation, concept of load angle
	2nd	2.2 Principles of operation, concept of load angle
	3rd	2.3. Derive torque, power developed.
	4th	2.4. Effect of varying load with constant excitation. Effect of varying excitation with constant load.
6THweek	1st	2.7. Explain effect of excitation on Armature current and power factor.
	2nd	2.8. Hunting in Synchronous Motor. 2.9. Function of Damper Bars in synchronous motor and generator.
	3rd	2.10. Describe method of starting of Synchronous motor.
	4th	2.11. State application of synchronous motor.

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

13th week	1st	5.2. Construction, working principle and application of Universal motors.
	2nd	5.2. Construction, working principle and application of Universal motors.
	3rd	5.3. Working principle of Repulsion start Motor, Repulsion start Inductionrun motor, Repulsion Induction motor.
	4th	5.3. Working principle of Repulsion start Motor, Repulsion start Inductionrun motor, Repulsion Induction motor.
14th week	1st	**6. SPECIAL ELECTRICAL MACHINE:** 6.1. Principle of Stepper motor. 6.2. Classification of Stepper motor.
	2nd	6.3. Principle of variable reluctant stepper motor.
	3rd	6.4. Principle of Permanent magnet stepper motor.
	4th	6.5. Principle of hybrid stepper motor.
15th week	1st	**7. THREE PHASE TRANSFORMERS:** 7.1. Explain Grouping of winding, Advantages.
	2nd	7.2. Explain parallel operation of the three phase transformers.
	3rd	7.2. Explain parallel operation of the three phase transformers.
	4th	7.3. Explain tap changer (On/Off load tap changing)

Dnyaneshwar Bodare 24/06/24
SIGN OF FACULTY

29/6/24
SIGN OF SR. LECT.

Head of Dept. (HOD)
Electrical

29/6/24
SIGN OF PRINCIPAL