BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

DEPARTMENT OF ELECTRICAL ENGINEERING

LESSON PLAN

SUBJECT : ENERGY CONVERSION -II

FACULTY : SMT.SNEHALATA SAMAL

ACADEMIC SESSION: 2024-25

SEMESTER:5TH

SECTION:B

Discipline: **Electrical Engg.**	Semester: **5th (A)**	Name of the teaching faculty: **Er. Snehalata Samal**
Subject-**Energy Conversion -II**	No. of Days/per week class allotted:**04 PERIODS/WEEK (TUE,WED,THUR,FRI-1 period each)**	Semester: From Date: 0**1/07/2024** To Date:08**/11/2024** No. of weeks: **19 WEEKS**
Week	**Class Day**	**Theory Class**
1st (01/07/2024-06-07-2024)	02/07/2024	Introduction
	03/07/2024	**1.ALTERNATOR:** 1.1 Types of alternator and their constructional features
	04/07/2024	1.2 Basic working principle of alternator and the relation between speed and frequency.
	05/07/2024	1.3 Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor)
2nd (08/07/2024-13/07/2024)	09/07/2024	1.3 Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor)
	10/07/2024	1.4 Explain harmonics, its causes and impact on winding factor.
	11/07/2024	1.5 E.M.F equation of alternator. (Solve numerical problems).
	12/07/2024	1.5 E.M.F equation of alternator. (Solve numerical problems).
3rd (15/07/2024-20/07/2024)	16/07/2024	1.6. Explain Armature reaction and its effect on emf at different power factor of load.
	19/07/2024	1.7 The vector diagram of loaded alternator. (Solve numerical).

4th(22/07/2024-27/07/2024)	23/07/2024	1.7 The vector diagram of loaded alternator. (Solve numerical).
	24/07/2024	1.8 Testing of alternator (Solve numerical problems)1.8.1 Open circuittest.1.8.2 Short circuit test
	25/07/2024	1.8.1 Open circuit test. 1.8.2 Short circuit test.
	26/07/2024	1.9 Determination of voltage regulation of Alternator by direct loading and synchronous impedance method. (Solve numerical problems)
5th(29/07/2024-03/08/2024)	30/07/2024	1.9 Determination of voltage regulation of Alternator by direct loading and synchronous impedance method. (Solve numerical problems)
	31/07/2024	1.10 Parallel operation of alternator using synchro-scope and dark & bright
	01/08/2024	1.11Explain distribution of load by parallel connected alternators.
	02/08/2024	**2.SYNCHRONOUSMOTOR:** 2.1 Constructional feature of Synchronous Motor.
6th(05/08/2024-10/08/2024)	06/08/2024	**Class Test-1**
	07/08/2024	2.2 Principles of operation, concept of load angle.
	08/08/2024	2.3 Derive torque, power developed
	09/08/2024	2.4 Effect of varying load with constant excitation.
7th(12/08/2024-17/08/2024)	13/08/2024	2.5 Effect of varying excitation with constantload.2.6 Power angle characteristics of cylindrical rotor motor
	14/08/2024	2.7 Explain effect of excitation on Armature current and power factor.
	16/08/2024	2.8Hunting in Synchronous Motor. 2.9 Function of Damper Bars in synchronous motor and generator
8th(19/08/2024-24/08/2024)	20/08/2024	2.10 Describe method of starting of Synchronous motor.2.11 State application of synchronous motor.

	21/08/2024	**3. THREE PHASE INDUCTIONMOTOR:** 3.1 Production of rotating magnetic field
	22/08/2024	3.2 Constructional feature of Squirrel cage and Slip ring induction motors
	23/08/2024	3.3 Working principles of operation of 3-phase Induction motor.
9th(26/08/2024-31-08/2024)	27/08/2024	3.4 Define slip speed, slip and establish the relation of slip with rotor quantities
	28/08/2024	3.5 Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (solve numerical problems)
	29/08/2024	3.6 Torque-slip characteristics.
	30/08/2024	3.7Derive relation between full load torque and starting torque etc. (solve numerical problems)
10th(02/09/2024-07/09/2024)	03/09/2024	3.7Derive relation between full load torque and starting torque etc. (solve numerical problems)
	04/09/2024	3.7Derive relation between full load torque and starting torque etc. (solve numerical problems)
	05/09/2024	3.8Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems)
	06/09/2024	3.8Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems)
11th(09/09/2024-14/09/2024)	10/09/2024	**Internal Assessment**
	11/09/2024	**Internal Assessment**
	12/09/2024	3.8Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems)
	13/09/2024	3.9 Methods of starting and different types of starters used for three phase Induction motor.
12th(16/09/2024-21/09/2024)	17/09/2024	3.10 Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods.
	18/09/2024	3.11 Plugging as applicable to three phase inductionmotor.3.12 Describe different types of motor enclosures.

	19/09/2024	**4.SINGLE PHASE INDUCTIONMOTOR:** 4.1 Explain Ferrari's principle.
	20/09/2024	4.2Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor.
13th(23/09/2024-28/09/2024)	24/09/2024	**Quiz Test**
	25/09/2024	4.3Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors.
	26/09/2024	4.3.1Split phase motor
	27/09/2024	4.3.2Capacitor Start motor. 4.3.3Capacitor start, capacitor run motor
14th(30/09/2024-05/10/2024)	01/10/2024	4.3.4 Permanent capacitor type motor. 4.3.5 Shaded pole motor
	03/10/2024	4.4Explain the method to change the direction of rotation of above motors
	04/10/2024	**5 COMMUTATORMOTORS:** 5.1Construction, working principle, running characteristic and application of single phase series motor.
15th(14/10/2024-19/10/2024)	15/10/2024	5.1 Construction, working principle, running characteristic and application of single phase series motor.
	17/10/2024	5.2 Construction, working principle and application of Universal motors.
	18/10/2024	5.3Working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor.
16th(21/10/2024-26/10/2024)	22/10/2024	5.3Working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor
	23/10/2024	**Class Test-2.**
	24/10/2024	**6.STEPPER MOTOR** 6.1 Principle of Stepper motor. 6.2Classification of Stepper motor.

	25/10/2024	6.3Principle of variable reluctant stepper motor.
17th(28/10/2024-02/11/2024)	29/10/2024	6.4Principle of Permanent magnet stepper motor.
	30/10/2024	6.5 Principle of hybrid stepper motor. 6.6Applications of Stepper motor
	01/11/2024	**7. THREE PHASE TRANSFORMERS:** 7.1 Explain Grouping of winding, Advantages.
18th(04/11/2024-08/11/2024)	05/11/2024	7.2 Explain parallel operation of the three phase transformers
	06/11/2024	7.3 Explain tap changer (On/Off load tap changing) 7.4Maintenance Schedule of Power Transformers
	07/11/2024	**PREVIOUS YEAR QUESTION DISCUSSION**