

BALASORE SCHOOL OF ENGINEERING, BALASORE.

LESSION PLAN / SEMESTER – 5TH. (WINTER - 2023)

SUB: - Energy Conversion-II

THEORY: - 02

FACULTY - Er. K. DAS

**BRANCH: - ELECTRICAL
(SEC - A)**

SL. NO	CH. NO.	MONTH WISE NO. OF CLASS	DATE	TOPICS TO BE COVERED	NO. OF CLASSES AS PER SYLLABUS	NO. OF CLASSES AS PER LESSION PLAN
01	01	AUGUST (14)	10/08/2023	Introduction to Energy conversion.	13	14
				CH.1 ALTERNATOR		
02			11/08/2023	1.1. Types of alternators and their constructional features.		
03			12/08/2023	1.2. Basic working principle of alternator and the relation between speed and frequency.		
04			16/08/2023	1.3. Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor).		
05			17/08/2023	1.4. Explain harmonics, its causes and impact on winding factor.		
06			18/08/2023	1.5. E.M.F equation of alternator. (Solve numerical problems).		
07			19/08/2023	1.6. Explain Armature reaction and its effect on emf at different power factor of load.		
08			21/08/2023	1.7. The vector diagram of loaded alternator. (Solve numerical problems)		
09			23/08/2023	1.8. Testing of alternator (Solve numerical problems)		
10			24/08/2023	1.8.1. Open circuit test. 1.8.2. Short circuit test.		
11			25/08/2023	1.9. Determination of voltage regulation of Alternator by direct loading and synchronous impedance method. (Solve numerical problems)		
12			26/08/2023	1.10. Parallel operation of alternator using synchro-scope and dark & bright lamp method.		
13			28/08/2023	1.11. Explain distribution of load by parallel connected alternators.		
			CH.2 SYNCHRONOUS MOTOR			

14	02	SEPTEMBER (19)	31/08/2023	2.1. Constructional feature of Synchronous Motor. 2.2. Principles of operation, concept of load angle	07	08
15			01/09/2023	2.3. Derive torque, power developed. 2.4. Effect of varying load with constant excitation.		
16			02/09/2023	2.5. Effect of varying excitation with constant load. 2.6. Power angle characteristics of cylindrical rotor motor.		
17			04/09/2023	2.7. Explain effect of excitation on Armature current and power factor.		
18			07/09/2023	2.8. Hunting in Synchronous Motor. 2.9. Function of Damper Bars in synchronous motor and generator.		
19			08/09/2023	2.10. Describe method of starting of Synchronous motor.		
20			09/09/2023	2.11. State application of synchronous motor.		
				CH.3 THREE PHASE INDUCTION MOTOR		
20	03		11/09/2023	3.1. Production of rotating magnetic field.	11	14
21			13/09/2023	3.2. Constructional feature of Squirrel cage and Slip ring induction motors.		
22			14/09/2023	3.3. Working principles of operation of 3-phase Induction motor. 3.4. Define slip speed, slip and establish the relation of slip with rotor quantities.		
23			15/09/2023	3.5. Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (Solve numerical problems)		
24			16/09/2023	3.6. Torque-slip characteristics.		
25			21/09/2023	3.7. Derive relation between full load torque and starting torque etc. (solve numerical problems)		
26			22/09/2023	3.8. Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (Solve numerical problems)		
27			23/09/2023	3.9. Methods of starting and different types of starters used for three phase Induction motor.		

28			25/09/2023	3.10. Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods.		
29			27/09/2023	3.11. Plugging as applicable to three phase induction motor.		
30			28/09/2023	3.12. Describe different types of motor enclosures.		
31			29/09/2023	3.13. Explain principle of Induction Generator and state its applications.		
				CH.4 SINGLE PHASE INDUCTION MOTOR		
32			30/09/2023	4.1. Explain Ferrari's principle. 4.2. Explain double revolving field theory and Cross-field theory to analyse starting torque of 1-phase induction motor.		
33	04	OCTOBER (09)	04/10/2023	4.3. Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors.	08	08
34			05/10/2023	4.3.1. Split phase motor.		
35			06/10/2023	4.3.2. Capacitor Start motor.		
36			07/10/2023	4.3.3. Capacitor start, capacitor run motor. 4.3.4. Permanent capacitor type motor.		
37			09/10/2023	4.3.5. Shaded pole motor.		
38			11/10/2023	4.4. Explain the method to change the direction of rotation of above motors.		
39			12/10/2023	CLASS TEST		
				CH.5 COMMUTATOR MOTORS		
40	05		13/10/2023	5.1. Construction, working principle, running characteristic and application of single-phase series motor.		
41			30/10/2023	5.2. Construction, working principle and application of Universal motors.		
42			01/11/2023	5.3.1 Working principle of Repulsion start Motor,	05	06
43			02/11/2023	5.3.2 Repulsion start Induction run motor		
44			03/11/2023	5.3.3 Repulsion Induction motor.		
				CH.6 SPECIAL ELECTRICAL MACHINE		
45			04/11/2023	6.1. Principle of Stepper motor		

46	06	NOVEMBER (14)	06/11/2023	6.2. Classification of Stepper motor.	05	05	
47			08/11/2023	6.3. Principle of variable reluctant stepper motor			
48			09/11/2023	6.4. Principle of Permanent magnet stepper motor			
49			10/11/2023	6.5. Principle of hybrid stepper motor. 6.6. Applications of Stepper motor.			
	07			CH. 7 THREE PHASE TRANSFORMERS		06	05
50			11/11/2023	7.1. Explain Grouping of winding, Advantages.			
51			13/11/2023	7.2. Explain parallel operation of the three phase transformers.			
52			15/11/2023	7.3. Explain tap changer (On/Off load tap changing)			
53			16/11/2023	7.4. Maintenance Schedule of Power Transformers.			
54			17/11/2023	CLASS TEST			
55			18/11/2023	CLASS TEST			
TOTAL					55	60	

MONTH WISE:-

MONTH	CHAPTER	REMARK
AUGUST	CH.-01, CH.-02(UP TO 2.2)	20%
SEPTEMBER	CH.-02(2.3 – 2.11), CH.-03, CH.-04 (UP TO 4.2)	30%
OCTOBER	CH.-04(4.3 – 4.4), CH.-05 (UP TO 5.2)	35%
NOVEMBER	CH.-05(5.3 – 5.3.3), CH.-06, CH.-07	15%
TOTAL		100%

Sig. of Faculty

Sig. of H.O.D

Sig. of Principal