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DEPARTMENT OF ELECTRICAL ENGINEERING Govt. Polytechnic, Balasore

LESSON PLAN FOR ACADEMIC SESSION - 2023-24 ENERGY CONVERSION-II

Course Code : Th.2	Semester : 5 TH
Total Periods : 60 Periods	Examination : 3 Hours
Theory Periods : 4 P/Week	Internal Assessment : 20 Marks
Tutorial : -Nil	End Semester Examination : 80 Marks
Maximum Marks : 100	
Semester From Date : 1 st August 2023	To Date :
Name of Teaching Faculty: Er. Anita Shial	

WEEK	PERIOD	TOPIC
1st	1 st	State types of alternator and their constructional features.
	2 nd	Explain working principle of alternator and establish the relation between speed and frequency
	3 rd	Explain terminology in armature winding, and derive expressions for winding factors (Pitch factor, Distribution factor)
	4 th	Explain harmonics, its causes and impact on winding factor.
2nd	1 st	Derive E.M.F equation.
	2 nd	Solve numerical problems
	3 rd	Explain Armature reaction and its effect on emf at different pf of load.
	4 th	Draw the vector diagram of loaded alternator. (Solve numerical problems)
3rd	1 st	State and explain testing of alternator (open circuit and short circuit methods)
	2 nd	Solve numerical problems
	3 rd	Determination of voltage regulation of Alternator by direct loading and synchronous impedance method.
	4 th	Explain parallel operation of alternator using synchro-scope, dark and bright lamp method.

4th	1 st	Explain distribution of load by parallel connected alternators.
	2 nd	Tutorial
	3 rd	Explain constructional feature of Synchronous Motor.
	4 th	Explain principles of operation, concept of load angle.
5th	1 st	Explain effect of varying load with constant excitation.
	2 nd	Explain effect of varying excitation with constant load.
	3 rd	Derive torque, power developed
	4 th	Explain power angle characteristics of cylindrical rotor motor.
6th	1 st	Explain effect of excitation on Armature current and power factor. Explain Hunting & function of Damper Bars.
	2 nd	Describe method of starting of Synchronous motor. State application of synchronous motor.
	3 rd	Explain and derive production of rotating magnetic field.
	4 th	Explain constructional feature of Squirrel cage and Slip ring induction motors
7th	1 st	Explain principles of operation of 3-phase Induction motor.
	2 nd	Explain slip speed, slip and slip relation with rotor quantities.
	3 rd	Derive Torque during starting and running and conditions for maximum torque.
	4 th	Solved numerical problems
8th	1 st	Derive Torque-slip characteristics.
	2 nd	Derive relation between full load torque and starting torque etc. (solve numerical problems)
	3 rd	Determine the relations between Rotor Copper loss, Rotor output and Gross Torque, and relationship of slip with rotor copper loss.
	4 th	Explain and state Methods of starting and different types of starters.
9th	1 st	Explain speed control by Voltage Control, Rotor resistance control, pole changing, frequency control methods.
	2 nd	Describe plugging applicable to three phase induction motor.
	3 rd	Describe different types of motor enclosures.
	4 th	Explain principle of Induction Generator and state its applications.
10th	1 st	Explain Ferrari's principle.
	2 nd	Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors.
	3 rd	Split phase motor. Capacitor Start motor.
	4 th	Capacitor start, capacitor run motor Permanent capacitor type motor

11th	1 st	Shaded pole motor.
	2 nd	Explain the method to change the direction of rotation of above motors
	3 rd	Tutorial
	4 th	Explain construction, working principle of 1 phase series motor.
12th	1 st	Running characteristic and application of single phase series motor.
	2 nd	Explain construction, working principle and application of Universal motors.
	3 rd	Explain working principle of Repulsion start Motor, ,
	4 th	Repulsion start Induction run motor.
13th	1 st	Repulsion Induction motor.
	2 nd	Principle of Stepper motor.
	3 rd	Classification of Stepper motor.
	4 th	Principle of variable reluctant stepper motor.
14th	1 st	Principle of Permanent magnet stepper motor.
	2 nd	Principle of hybrid stepper motor. Applications of Stepper motor.
	3 rd	Explain Grouping of winding, Advantages.
	4 th	Explain parallel operation of the three phase transformers.
15th	1 st	Explain tap changer (On/Off load tap changing)
	2 nd	State maintenance of Transformers.
	3 rd	Tutorial
	4 th	Tutorial

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01/08/2023
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