

ACADEMIC SESSION : 2023-24(Winter)

Discipline : Electrical engineering	Semester : 5th	Name of the Teaching Faculty : Kiran Kumar Bhoi
Subject : Energy Conversion-2	No. of days / week class allotted	Semester From date: : 01/08/2023 to 30/11/2023 Nos. of Weeks per semester : 15
Week	Class Day	Theory Topics
1 ST	1 st	Types of alternator and their constructional features
	2 nd	Basic working principle of alternator and the relation between speed and frequency.
	3 rd	Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor).
	4 th	Explain harmonics, its causes and impact on winding factor.
2 ND	1 st	E.M.F equation of alternator. (Solve numerical problems).
	2 nd	Explain Armature reaction and its effect on emf at different power factor of load.
	3 rd	The vector diagram of loaded alternator.
	4 th	(Solve numerical problems) vector diagram
3 RD	1 st	Testing of alternator -Open circuit test, Short circuit test
	2 nd	Testing of alternator (Solve numerical problems)
	3 rd	Determination of voltage regulation of Alternator by direct loading and synchronous impedance method. (Solve numerical problems)
	4 th	Parallel operation of alternator using synchro-scope and dark & bright lamp method.
4 TH	1 st	Explain distribution of load by parallel connected alternators.
	2 nd	Constructional feature of Synchronous Motor.
	3 rd	Principles of operation, concept of load angle
	4 th	Derive torque, power developed.
5 TH	1 st	Effect of varying load with constant excitation.
	2 nd	Effect of varying excitation with constant load.
	3 rd	Power angle characteristics of cylindrical rotor motor.
	4 th	Explain effect of excitation on Armature current and power factor.

6 TH	1 st	Hunting in Synchronous Motor.
	2 nd	Function of Damper Bars in synchronous motor and generator.
	3 rd	Describe method of starting of Synchronous motor.
	4 th	State application of synchronous motor.
7 TH	1 st	Production of rotating magnetic field.
	2 nd	Constructional feature of Squirrel cage and Slip ring induction motors.
	3 rd	Working principles of operation of 3-phase Induction motor
	4 th	Define slip speed, slip and establish the relation of slip with rotor quantities.
8 TH	1 st	Derive expression for torque during starting and running conditions and derive conditions for maximum torque
	2 nd	(solve numerical problems)
	3 rd	Torque-slip characteristics.
	4 th	Derive relation between full load torque and starting torque etc
9 TH	1 st	(solve numerical problems)
	2 nd	Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss.
	3 rd	solve numerical problems
	4 th	Methods of starting and different types of starters used for three phase Induction motor part 1
10 TH	1 st	Methods of starting and different types of starters used for three phase Induction motor part 2
	2 nd	Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods.
	3 rd	Plugging as applicable to three phase induction motor
	4 th	Describe different types of motor enclosures.
11 TH	1 st	Explain principle of Induction Generator and state its applications.
	2 nd	Explain Ferrari's principle.

	3 rd	Explain double revolving field theory and Cross-field theory to analyze starting torque of 1 -phase induction motor.
	4 th	Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors, Split phase motor, Capacitor Start motor.0
12 th	1 st	Capacitor start, capacitor run motor, Permanent capacitor type motor, Shaded pole motor.
	2 nd	Explain the method to change the direction of rotation of above motors.
	3 rd	Construction, working principle, running characteristic and application of single phase series motor.
	4 th	Construction, working principle and application of Universal motors.
13 th	1 st	Working principle of Repulsion start Motor, Repulsion start Induction run motor
	2 nd	Working principle of Repulsion Induction motor.
	3 rd	Principle of Stepper motor.
	4 th	Classification of Stepper motor
14 th	1 st	Principle of variable reluctance stepper motor.
	2 nd	Principle of Permanent magnet stepper motor.
	3 rd	Principle of hybrid stepper motor.
	4 th	Applications of Stepper motor.
15 th	1 st	Explain Grouping of winding, Advantages.
	2 nd	Explain parallel operation of the three phase transformers.
	3 rd	Explain tap changer (On/Off load tap changing)
	4 th	Maintenance Schedule of Power Transformers.

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29.7.23

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