

TH.2. ENERGY CONVERSION-II

THEORY PERIODS - 4P/WEEK

TOTAL PERIODS - 60 PERIODS
NAME OF THE FACULTY - MRS DAMAYANTI BHATT

WEEK	DAY	TOPIC
		<u>1. Alternator</u>
1st	1st	1.1 Types of alternator and their constructional features
	2nd	1.2. Basic working principle of alternator and the relation between speed and frequency
	3rd, 4th	1.3. Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor)
2nd	1st	1.4. Explain harmonics, its causes and impact on winding factor
	2nd, 3rd	1.5. Emf equation of alternator (Solve numerical problems)
	4th	1.6. Explain Armature reaction and its effect on emf at diff p.f. & load
3rd	1st	1.7. The vector diagram of loaded alternator (Solve numerical problem)
	2nd, 3rd	1.8. Testing of alternator (solve numerical problems) OC test & SC test
	4th	1.9. Determination of voltage regulation of Alternator by direct loading and synchronous impedance method (Solve numerical problems)
4th	1st	1.10 Parallel operation of alternator using synchroscope and dark and bright lamp method
	2nd	1.11 Explain distribution of load by parallel connected alternators
		<u>2. Synchronous Motor</u>
	3rd	2.1 Constructional feature of synchronous Motor

WEEK	DAY	TOPICS
	4th	2.2. Principles of operation, concept of load angle
5th	1st	2.3. Derive torque, power developed
	2nd, 3rd	2.4. Effect of varying load with const excitation
	4th	2.5. Effect of varying excitation with const load
6th	1st	2.6. Power angle characteristics of cylindrical rotor motor
	2nd, 3rd	2.7. Explain effect of excitation on armature current and p.f.
	4th	2.8. Hunting in synchronous motor
7th	1st	2.9. Function of Damper Bars in synchronous motor and generator
	2nd	2.10. Describe method of starting of synchronous motor
	3rd	2.11 State application of synchronous motor.
		3. 3- ϕ I.M.
	4th	3.1. Production of rotating mag field
8th	1st	3.2. Constructional feature of squirrel cage and slip-ring I.M.
	2nd	3.3. Working principles of operation of 3- ϕ I.M.
	3rd	3.4. Define slip speed, slip and establish the relation of slip with rotor quantities
	4th	3.5. Derive expression for torque during starting and running conditions and derive conditions for maximum torque (solve numerical problems)
9th	1st	3.6. Torque-slip characteristics
	2nd	3.7. Derive relation between

WEEK

DAY

TOPIC

full load torque and starting torque etc. (Solve numerical problems)

3rd 3.8. Establish the relations betⁿ Rotor Cu loss, Rotor o/p & gross torque and relationship of slip with rotor Cu loss (Solve numerical problems)

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10th 1st 3.9: Methods of starting and different types of starters used for 3- ϕ I.M

2nd 3.10. Explain speed control by voltage control, Rotor resistance control, Pole changing, Frequency control Methods

3rd 3.10 Plugging as applicable to 3- ϕ I.M

4th 3.12 Describe different types of motor enclosures

11th 1st 3.13 Explain principle & Induction generator
4. 1- ϕ I.M.

2nd 4.1. Explain Ferraris's principle

3rd 4.2. Explain double revolving field theory & cross-field theory to analyze starting torque of 1-phase I.M.

4th 4.3. Explain principle, Torque-speed characteristics, performance & applications

12th 1st 4.3.1 Split phase motor

1st 4.3.2 Capacitor Start Motor

2nd 4.3.3 Capacitor Start capacitor run Motor

2nd 4.3.4 Permanent Capacitor type motor

3rd 4.3.5 Shaded pole motor

4th 4.4 Explain the method to change the direction of rotation of above motors

5: Commutator Motors

13th 1st 5.1 Constructⁿ, Working principle, running characteristics and applications of 1- ϕ Series motor

WEEK	DAY	TOPIC
	2nd	5.2 Construction, working principle & application of Universal motor
	3rd	5.3. Working Principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction Motor
		6. Special Electrical Machine
	4th	6.1 Principle of Stepper Motor
14th	1st	6.2. Classification of Stepper Motor
	1st	6.3. Principle of variable reluctance stepper motor
	2nd	6.4. Principle of Permanent Magnet Stepper Motor
	3rd	6.5. Principle of Hybrid stepper Motor
	4th	6.6. Applications of Stepper Motor
		7. 3-ϕ T/F
15th	1st	7.1 Explain Grouping of winding, Advantages
	2nd	7.2. Explain parallel operation of 3- ϕ T/F
	3rd	7.3. Explain tap changer (ON/OFF load tap changing)
	4th	7.4. Maintenance Schedule of Power T/F