

LESSION PLAN 5 TH SEMESTER(2021-22)				
SUBJECT-Th2. ENERGY CONVERSION – II				
NAME OF THE FACULTY-DEBASIS PATRA				
MONTH	UNIT	COURSE TO BE COVERED	TOTAL NO. OF CLASS	REMARK
OCTOBER	UNIT-1	Alternator (Synchronous Generator)	14	
		Types of alternator and their constructional features.	01	
		Basic working principle of alternator and the relation between speed and frequency.	01	
		Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor).	01	
		Explain harmonics, its causes and impact on winding factor.	01	
		E.M.F equation of alternator. (Solve numerical problems)	01	
		Explain Armature reaction and its effect on emf at different power factor of load.	01	
		The vector diagram of loaded alternator. (Solve numerical problems)	02	
		Testing of alternator (Solve numerical problems) Open circuit test. Short circuit test.	02	
		Determination of voltage regulation of Alternator by direct loading and synchronous impedance method. (Solve numerical problems)	02	
		Parallel operation of alternator using synchro-scope and dark & bright lamp method.	01	
		Explain distribution of load by parallel connected alternators	01	
	UNIT-2	Synchronous Motor	08	
		Constructional feature of Synchronous Motor. Principles of operation, concept of load angle	02	
		Derive torque, power developed.	01	
		Effect of varying load with constant excitation. Effect of varying excitation with constant load	01	
		Power angle characteristics of cylindrical rotor motor. Explain effect of excitation on Armature current and power factor.	02	

		Hunting in Synchronous Motor. Function of Damper Bars in synchronous motor and generator.	01	
		Describe method of starting of Synchronous motor. State application of synchronous motor.	01	
NOVEMBER	UNIT-3	THREE PHASE INDUCTION MOTOR	14	
		Production of rotating magnetic field.	01	
		Constructional feature of Squirrel cage and Slip ring induction motors.	01	
		Working principles of operation of 3-phase Induction motor	01	
		Define slip speed, slip and establish the relation of slip with rotor quantities.	01	
		Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (solve numerical problems)	01	
		Torque-slip characteristics	01	
		Derive relation between full load torque and starting torque etc. (solve numerical problems)	01	
\		Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems)	01	
		Methods of starting and different types of starters used for three phase Induction motor.	01	
		Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods	02	
		Plugging as applicable to three phase induction motor.	01	
		Describe different types of motor enclosures.	01	
		Explain principle of Induction Generator and state its applications	01	
	UNIT-4	SINGLE PHASE INDUCTION MOTOR	08	
		Explain Ferrari's principle.	01	
		Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor.	01	
		Explain Working principle, Torque speed characteristics, performance characteristics	05	

		and application of following single phase motors. 4.3.1. Split phase motor. 4.3.2. Capacitor Start motor. 4.3.3. Capacitor start, capacitor run motor. 4.3.4. Permanent capacitor type motor. 4.3.5. Shaded pole motor		
		Explain the method to change the direction of rotation of above motors.	01	
DECEMBER	UNIT-5	COMMUTATOR MOTORS	06	
		Construction, working principle, running characteristic and application of single phase series motor	02	
		Construction, working principle and application of Universal motors.	02	
		Working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor.	02	
	UNIT-6	SPECIAL ELECTRICAL MACHINE	05	
		Principle of Stepper motor	01	
		Classification of Stepper motor	01	
		Principle of variable reluctant stepper motor.		
		Principle of Permanent magnet stepper motor.	01	
		Principle of hybrid stepper motor.	01	
		Applications of Stepper motor.	01	
JANUARY	UNIT-7	THREE PHASE TRANSFORMERS	05	
		Explain Grouping of winding, Advantages.	01	
		Explain parallel operation of the three phase transformers.	02	
		Explain tap changer (On/Off load tap changing)	01	
		Maintenance Schedule of Power Transformers.	01	