

GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT

LessonPlan

Name of the Program	Diploma in Electrical Engineering			
Course Name	Energy Conversion II		Course Code	C302
Course Year	3rd	Semester	5th	Academic Period
				2022-23
No. of Classes allotted per Week	05	Planned Classes Required to Complete the Course		60

Sl.No.	Topic to be covered	Module	No. of hours Required	Mode of Teaching
1	Types of alternator and their constructional features, Basic working principle of alternator and the relation between speed and frequency.	I	01	LM/IM
2	Basic working principle of alternator and the relation between speed and frequency.	I	02	LM/IM
3	Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor).	I	01	LM/IM
4	Explain harmonics, its causes and impact on winding factor. E.M.F equation of alternator. (Solve numerical problems).	I	02	LM/IM
5	Explain Armature reaction and its effect on EMF at different power factor of load. The vector diagram of loaded alternator. (Solve numerical problems)	I	02	LM/IM
6	Testing of alternator (Solve numerical problems) (i) Open circuit test. (ii) Short circuit test.	I	02	LM/IM
7	Determination of voltage regulation of Alternator by direct loading and synchronous impedance method. (Solve numerical problems)	I	02	LM/IM
8	Parallel operation of alternator using synchro-scope and dark & bright lamp method. Explain distribution of load by parallel connected alternators.	I	02	LM/IM
9	Constructional feature of Synchronous Motor, Principles of operation, concept of load angle	II	02	LM/IM
10	Derive torque, power developed, Effect of varying load with constant excitation.	II	02	LM/IM
11	Effect of varying excitation with constant load, Power angle characteristics of cylindrical rotor motor	II	01	LM/IM
12	Explain effect of excitation on Armature current and power factor, Hunting in Synchronous Motor	II	01	LM/IM
13	Function of Damper Bars in synchronous motor and generator, Describe method of starting of Synchronous motor, Application of synchronous motor	II	02	LM/IM
14	Production of rotating magnetic field, Constructional feature of Squirrel cage and Slip ring induction motors.	III	01	LM/IM
15	Working principles of operation of 3-phase Induction motor, Define slip speed, slip and establish the relation of slip with rotor quantities	III	01	LM/IM
16	Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (solve numerical problems)	III	01	LM/IM

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17	Torque-slip characteristics, Derive relation between full load torque and starting torque etc. (solve numerical problems)	III	01	LM/IM
18	Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems)	III	02	LM/ IM/
19	Methods of starting and different types of starters used for three phase Induction motor.	III	02	LM/IM
20	Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods	III	02	LM/IM
21	Plugging as applicable to three phase induction motor, Describe different types of motor enclosures.	III	02	LM/IM
22	Explain principle of Induction Generator and state its applications	III	02	LM/IM
23	Explain Ferrari's principle. 4.2. Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor	IV	02	LM/IM
24	Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors.	IV	02	LM/IM
25	Split phase motor, Capacitor Start motor, Capacitor start, capacitor run motor, Permanent capacitor type motor, Shaded pole motor	IV	02	LM/IM
26	Explain the method to change the direction of rotation of above motors.	IV	02	LM/IM/
27	Construction, working principle, running characteristic and application of single phase series motor.	V	02	LM/IM
28	Construction, working principle and application of Universal motors.	V	02	LM/IM
29	Working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor.	V	02	LM/IM
30	Principle of Stepper motor, Classification of Stepper motor.	VI	01	LM/IM
31	Principle of variable reluctance stepper motor, Principle of Permanent magnet stepper motor.	VI	02	LM/IM
32	Principle of hybrid stepper motor, Applications of Stepper motor.	VI	02	LM/IM
33	Explain Grouping of winding, Advantages, Explain parallel operation of the three phase transformers.	VII	03	LM/IM
34	Explain tap changer (On/Off load tap changing), Maintenance Schedule of Power Transformers.	VII	02	LM/IM

Signature of the Faculty

Signature of the HoD