Electrical Engineering Department

Lesson Plan

Name of Faculty	**Sh. Amit Sharma**
Discipline	**Electrical Engineering**
Semester	**5th**
Subject	**Electrical Machines-II**
Lesson Plan Duration	**1/09/2023 to 15/12/2023**
Work load [Theory + Practical] Per Week	**[04+02]**

Week	Day	Theory Topic/ Assignment/ Test	No.	Practical
1st	1	Unit1: Introduction Synchronous Machines	1	Demonstration of revolving field set up by a 3-phase wound stator
	2	Constructional features of synchronous machine		
	3	Generation of three phase emf		
	4	Production of rotating magnetic field in a three phase winding		
	5	Revision/ Review of above Topics		
2nd	1	Concept of distribution and coil span factor	2	To plot relationship between no load terminal voltage and excitation current in a synchronous generator at constant speed
	2	Drive Emf equation, synchronous speed		
	3	Armature reaction at unity, lag and lead power factor		
	4	Voltage regulation using synchronous impedance method		
	5	Revision/ Review of Topics		
3rd	1	Need and necessary conditions of parallel operation of alternators	3	Determination of the relationship between the voltage and load current of an alternator, keeping excitation and speed
	2	Operation of synchronous machine as a motor –its starting methods		
	3	Effect of change in excitation of a synchronous motor		
	4	Concept and Cause of hunting and its prevention		
	5	Revision/ Review of above Topics		
4th	1	Rating and cooling of synchronous machines	4	Revision/ file checking
	2	Applications of synchronous machines (as an alternator, as a synchronous condenser)		
	3	Revision of important topics		
	4	Assignment / Class test		
	5	Revision/ Review of above Topics		
5th	1	Problem solution/ test check	5	Determination of the regulation and efficiency of alternator from the open circuit and short circuit test
	2	Unit2: Introduction to Induction Motors		
	3	constructional features of squirrel cage and slip ring 3-phase induction Motors		
	4	Principle of operation, slip and its significance		
	5	Revision/ Review of above Topics		
6th	1	Locking of rotor and stator fields	6	Synchronization of polyphase alternators and load sharing
	2	Rotor resistance, inductance		
	3	Emf Equation and current relations		
	4	Relationship between copper loss and motor slip		
	5	Revision/ Review of above Topics		
	1	Power flow diagram of an induction motor		

7th	2	Factors determining the torque, Torque-slip curve, stable and unstable zones	7	Determination of the effect of variation of excitation on performance of a synchronous motor
	3	Effect of rotor resistance upon the torque slip relationship		
	4	Double cage rotor motor and its applications		
	5	Revision/ Review of above Topics		
8th	1	Starting of 3-phase induction motors, DOL	8	Study of ISI/BIS code for 3-phase induction motors
	2	Star-delta, auto transformer starting		
	3	Causes of low power factor of induction motors		
	4	Testing of 3-phase induction motor on no load		
	5	Revision of Unit No-01		
9th	1	And blocked rotor test and to find efficiency	9	Revision/ file checking
	2	Speed control of induction motor		
	3	Harmonics and its effects		
	4	cogging and crawling in Induction Motors		
	5	Revision of Unit No-01		
10th	1	Revision of important topics	10	Determination of efficiency by (a) no load test and blocked rotor test on an induction motor
	2	Assignment / Class test		
	3	Problem solution/ ClassTest check		
	4	Unit3: Fractional Kilo Watt (FKW) Motors		
	5	And its description		
11th	1	Single phase induction motors	11	Determination of effect of rotor resistance on torque speed curve of an induction motor
	2	Construction characteristics and applications		
	3	Nature of field produced in single phase induction motor		
	4	Split phase induction motors		
	5	Type of Induction Motor		
12th	1	Capacitors start and run	12	Revision/ file checking
	2	Shaded pole, Reluctance start motor		
	3	Alternating current series motor and universal motors		
	4	1-phase synchronous motor Reluctance type		
	5	Brief description about Synchronous Motor		
13th	1	Hysteresis motor	13	To study the effect of a capacitor on the single phase induction motor to reverse the direction of rotation.
	2	Revision of important topics		
	3	Assignment / Class test		
	4	Problem solution/ test check		
	5	Revision of important topics		
14th	1	Unit4:Special Purpose Machines	14	Quiz /viva-voice related to electrical machine
	2	Construction and working principle of linear induction motor		
	3	stepper motor		
	4	Servomotor		
	5	Revision of important topics		
15th	1	submersible motor	15	Quiz /viva-voice related to electrical machine
	2	introduction to energy efficient motors		
	3	Assignment / Class test		
	4	Problem solution/ test check		
	5	Problem solution/ test check		
16th	1	Problem solution/ test check	16	Internal Practical
	2	Revision/Review/Test of old HSBTE Papers		
	3	Revision/Review/Test of old HSBTE Papers		