

LESSON PLAN

Name of the faculty	:	MONIKA MEHTA
Discipline	:	Electrical Engg.
Semester	:	5 th
Subject	:	ELECTRICAL MACHINES-II (EM-II)
Lesson Plan Duration	:	15 weeks
Work Load	:	Lectures — 04

Week	Theory	
	Lecture Day	Topic (including assignment/test)
1 st	1 st	Main constructional features of synchronous machine including commutator and brushless excitation system.
	2 nd	—Continued— Main constructional features of synchronous machine
	3 rd	Generation of three phase emf.
	4 th	Production of rotating magnetic field in a three phase winding.
2 nd	5 th	Concept of distribution factor and coil span factor.
	6 th	EMF equation.
	7 th	Armature reaction at unity, lag and lead power factor.
	8 th	—Continued— Armature reaction at unity, lag and lead power factor.
3 rd	9 th	Operation of single synchronous machine independently supplying a load.
	10 th	Voltage regulation by synchronous impedance method.
	11 th	Need and necessary conditions of parallel operation of alternators.
	12 th	Synchronizing an alternator (Synchroscope method) with the bus bars.
4 th	13 th	—Continued— Synchronizing an alternator (Synchroscope method) with the bus bars.
	14 th	Operation of synchronous machine as a motor.
	15 th	Starting methods of synchronous motor.
	16 th	Effect of change in excitation of a synchronous motor.
5 th	17 th	Concept and Cause of hunting and its prevention.
	18 th	Rating and cooling of synchronous machines.
	19 th	Applications of synchronous machines (as an alternator, as a synchronous condenser).
	20 th	Taking assignment and doubts of the students and to give clarifications on the specific parts they have not understood.

6 th	21 st	Conducting class test-1.
	22 nd	Salient constructional features of squirrel cage induction motors.
	23 rd	Salient constructional features of slip ring 3-phase induction motors.
	24 th	Principle of operation, slip and its significance.
7 th	25 th	Locking of rotor and stator fields.
	26 th	Rotor resistance, inductance, emf and current.
	27 th	Relationship between copper loss and the motor slip.
	28 th	Power flow diagram of an induction motor.
8 th	29 th	Factors determining the torque.
	30 th	Torque-slip curve, stable and unstable zones.
	31 st	Effect of rotor resistance upon the torque slip relationship.
	32 nd	Double cage rotor motor and its applications.
9 th	33 rd	Starting of 3-phase induction motors using DOL starter.
	34 th	Starting of 3-phase induction motors using star-delta, auto transformer starters.
	35 th	Causes of low power factor of induction motors.
	36 th	Testing of 3-phase motor on no load and blocked rotor test and to find efficiency.
10 th	37 th	—Continued— Testing of 3-phase motor on no load and blocked rotor test and to find efficiency.
	38 th	Speed control of induction motor.
	39 th	Harmonics and its effects.
	40 th	Cogging and crawling in Induction Motors.
11 th	41 st	Taking assignment and doubts of the students and to give clarifications on the specific parts they have not understood.
	42 nd	Conducting class test-2.
	43 rd	Single phase induction motors; Construction characteristics and applications.
	44 th	—Continued—Single phase induction motors; Construction characteristics and applications.
12 th	45 th	Nature of field produced in single phase induction motor.
	46 th	Split phase induction motor-Capacitors start and run motor.
	47 th	Shaded pole motor.
	48 th	Reluctance start motor.
13 th	49 th	Alternating current series motor.

	50 th	Universal motor.
	51 st	Single phase synchronous motor- Reluctance motor
	52 nd	Hysteresis motor.
14 th	53 rd	Taking doubts of the students and to give clarifications on the specific parts they have not understood.
	54 th	Construction and working principle of linear induction motor.
	55 th	Construction and working principle of stepper motor.
	56 th	Construction and working principle of servomotor.
15 th	57 th	Construction and working principle of submersible motor.
	58 th	Introduction to energy efficient motors.
	59 th	Taking doubts of the students and to give clarifications on the specific parts they have not understood.
	60 th	Checking of Note Book.

LESSON PLAN

Name of the faculty: Ms. Maya
Discipline : Electrical Engg.
Semester : 5th
Subject : Programmable logic controllers and Microcontrollers
Lesson Plan Duration: 15 weeks

Week	Theory		Practical	
	Lecture day	Topic	Practical day	Topic
1st	1	What is PLC, concept of PLC	1st	Components/ subcomponents of a PLC and learning functions of different modules of a PLC system
	2	Building blocks of PLC		
	3	Functions of various blocks of PLC		
	4	Limitations of relays, Advantages of PLCs over electromagnetic relays		
	5	Revision and class test		
2nd	6	Different programming languages,	2nd	Practical steps in programming a PLC using hand held programmer
	7	PLC manufacturers and applications of PLC		
	8	Basic operation of PLC-		
	9	Principles of PLC		
	10	Revision and class test		
3rd	11	Architectural details of Processor-Part-I	3rd	Practical steps in programming a PLC using computer interfacing
	12	Architectural details of Processor-Part-II		
	13	Memory Structures		
	14	Input/output structures		
	15	Revision and class test		
4th	16	Programming Terminals of PLC	4th	Introduction to step 5programming language, ladder diagram concepts, instruction list syntax
	17	Power supply to PLC		
	18	Basic instructions for latch		
	19	Master control self holding relays		
	20	Revision and class test		
5th	21	Timer instructions-ON and OFF delay	5th	Basic logic operations, AND, Or, NOT functions
	22	Retentive timers, resetting of timers		
	23	Counter instructions like up counter, down counter, resetting of counters		
	24	Arithmetic Instructions (ADD,SUB,DIV,MUL etc.)		
	25	Revision and class test		
6th	26	MOV instruction, RTC (Real Time Clock function)	6th	Logic control systems with time response as applied to clamping operation
	27	Comparison instructions like equal, not equal, greater, greater than equal, less than, less than equal		
	28	Programming on Basic instructions		
	29	Programming on Timer instructions		
	30	Revision and class test		
7th	31	Programming on Counter instructions	7th	Sequence control system in lifting a device for packaging and counting
	32	Programming on Sequencer instructions		
	33	Programming on comparison instructions		
	34	Revision of Ladder diagram Programming		
	35	Revision and class test		
8th	36	Assembly line, Packaging, Process control	8th	Use of PLC for Door Bell operation
	37	Car parking, Doorbell operation, Traffic light control		
	38	Microwave oven, Washing machine, Motor in forward and reverse direction		

	39	Star delta, DOL Starter, paint industry ,filling of bottles, room Automation		
	40	Revision and class test		
9th	41	Microcontroller -Overview	9th	Use of PLC for Traffic light system
	42	Block diagram and architecture of Microcontroller		
	43	Overview of MCS-51		
	44	8051 -Pin details		
	45	Revision and class test		
10th	46	Input port structures	10th	Use of PLC for Packing process control
	47	Output port structures		
	48	Memory organisation		
	49	Special function registers		
	50	Revision and class test		
11th	51	Revision of Microcontroller	11th	Use of PLC for Car parking system
	52	Instruction set of MCS-51		
	53	Addressing modes		
	54	Timer operation		
	55	Revision and class test		
12th	56	Serial port operation and communication	12th	Familiarization with the study of architecture of 8085 kit, basic sub systems and input output connectors, function keys
	57	Interrupts and its types		
	58	Assemblers operations & compilers		
	59	Assembler directives		
	60	Revision and class test		
13th	61	keypad interfacing	13th	Familiarization of Microcontroller 8051 kit
	62	7- segment interface, LCD		
	63	Stepper motor interfacing		
	64	A/D, D/A interfacing		
	65	Revision and class test		
14th	66	RTC interfacing	14th	Testing of general input/output on microcontroller board
	67	Introduction of PIC Micro controllers		
	68	Features of PIC 16C84		
	69	Architecture of PIC 16C84		
	70	Revision and class test		
15th	71	Applications of microcontrollers	15th	Development of Electrical, Instrumentation applications using 8051 microcontroller
	72	Radio control system		
	73	Revision of complete syllabus		
	74	Revision and class test		
	75	Discussion of previous year HSBTE question papers		

LESSON PLAN

Faculty : Mr. Lokesh
Discipline : ELECTRICAL ENGINEERING
Semester : 5th
Subject : ELECTRICAL POWER - I
Duration :15 WEEKS
Work Load (Lecture) per week (in hours) : Theory- 04

Week	Theory	
	Lecture Day	Topic
1st	1st	Introduction to the subject and the marks distribution
	2nd	Main resources of energy, conventional and non-conventional
	3rd	Different types of power stations, thermal, hydro, gas, diesel and nuclear power Stations
	4th	stations on the basis of running cost, site, starting, maintenance etc.
2nd	1st	Importance of non-conventional sources of energy in the present scenario.
	2nd	Brief details of solar energy
	3rd	Brief details of bio-energy
	4th	Brief details of Wind energy
3rd	1st	Test Of Chapter No. 01
	2nd	Fixed and running cost, load estimation, load curves, demand factor
	3rd	Load factor, diversity factor, power factor and their effect on cost of generation
	4th	Numerical problems
4th	1st	Base load and peak load power stations advantages
	2nd	Inter-connection of power stations and its advantages
	3rd	Concept of regional and national grid
	4th	Test Of Chapter No. 02
5th	1st	Quiz No. 01 for chapter 01 and 02 and assessment of assignment No. 01
	2nd	Layout of transmission system, selection of voltage for H.T and L.T lines, advantages of high voltage for Transmission of power in both AC and DC
	3rd	Comparison of different systems: AC versus DC for power transmission
	4th	Conductor material and sizes from standard tables
6th	1st	Constructional features of transmission lines: Types of supports, types of insulators
	2nd	Types of conductors, Selection of insulators, conductors, earth wire and their accessories
	3rd	Transposition of conductors and string efficiency of suspension type insulators, Bundle Conductors.
	4th	Mechanical features of line: Importance of sag, calculation of sag,
7th	1st	Effects of wind and ice related problems
	2nd	Indian electricity rules pertaining to clearance
	3rd	Electrical features of line: Calculation of resistance without derivation in a.c. transmission line

	4th	Electrical features of line: Calculation of inductance without derivation in a.c. transmission line
8th	1st	Electrical features of line: Calculation of capacitance
	2nd	Concept of voltage regulation
	3rd	Concept of corona, Effects of corona and remedial measures
	4th	Transmission Losses
9th	1st	Test Of Chapter No. 03
	2nd	Lay out of HT and LT distribution system, constructional feature of distribution lines and their erection. LT feeders and service mains
	3rd	Simple problems on AC radial distribution system, determination of size of conductor; Preparation of estimates of HT lines (OH and Cables).
	4th	Preparation of estimates of LT lines (OH and Cables).
10th	1st	Constructional features of LT (400 V), HT (II kV) underground cables
	2nd	Advantages and Disadvantages of underground system with respect to overhead system
	3rd	Calculation of losses in distribution system
	4th	Faults in underground cables, determine fault location by Murray Loop Test
11th	1st	Test Of Chapter No. 04
	2nd	Quiz No. 02 for chapter 03 and 04 and assessment of assignment No. 02
	3rd	Brief idea about substations; out door grid sub-station 220/132 KV outdoor substations
	4th	Brief idea about substations; out door grid sub-station 66/33 KV outdoor substations
12th	1st	Pole mounted substations and indoor substation
	2nd	with it.
	3rd	Layout of 11 kV/400V distribution substation and various auxiliaries and equipment associated with it.
	4th	Test Of Chapter No. 05
13th	1st	Concept of power factor
	2nd	Reasons and disadvantages of low power factor
	3rd	Methods for improvement of power factor using capacitor banks
	4th	Methods for improvement of power factor using VAR Static Compensator (SVC)
14th	1st	Test Of Chapter No. 06
	2nd	Quiz No. 03 for chapter 05 and 06 and Assessment of assignment No. 03
	3rd	Revision test of Chapter No. 01
	4th	Revision test of Chapter No. 02
15th	1st	Revision test of Chapter No. 03
	2nd	Revision test of Chapter No. 04
	3rd	Revision test of Chapter No. 05
	4th	Revision test of Chapter No. 06

Lesson Plan

Name of Faculty : RISHI PAYAL
 Discipline : ELECTRICAL ENGG.
 Semester : 5TH
 Subject : UTILISATION OF ELECTRICAL ENERGY
 Lesson Plan Duration :13 Weeks

Week	Theory	
	Lecture Day	Topic (including assignment/test)
1 st	1	Advantages of electrical heating Resistance heating – direct and indirect resistance heating, electric ovens, their temperature range
	2	properties of resistance heating elements, domestic water heaters and other heating appliances, thermostat control circuit
2 nd	3	Induction heating; principle of core type and coreless induction furnace, their construction and applications
	4	Electric arc heating; direct and indirect arc heating, construction, working and applications of arc furnace
	5	Dielectric heating Infra-red heating and its applications
	6	Microwave heating and solar heating and their applications
	7	Calculation of resistance heating elements
3 rd	8	Problems and note book checking
	9	Advantages of electric welding Resistance welding- spot, projection, seam and butt welding
	10	Electric arc welding, carbon arc welding and their characteristics
	11	Metal and hydrogen arc welding, welding of aluminum and copper
	12	Power supply requirement. Advantages of using coated
4 th	13	comparison between AC and DC arc welding, welding control circuits,
	14	Problems and note book checking
		Need of electro-deposition

	15	Laws of electrolysis
	16	process of electro-deposition - clearing, operation, deposition of metals, polishing and buffing
	17	Equipment and accessories for electroplating
5th	18	Factors affecting electro-deposition
	19	Principle of galvanizing and its applications
	20	Principles of anodizing and its applications
	21	Electroplating of non-conducting materials
	22	Manufacture of chemicals by electrolytic process
6th	23	Power supplies for electroplating
	24	Principle of air conditioning, vapour pressure cycle
	25	refrigeration cycle, eco-friendly refrigerants
	26	Electrical circuit for refrigerator
	27	Electrical circuit for A.C- window type
7th	28	Construction and principle of split type AC
	29	Previous content
	30	Types of water cooler
	31	Storage type water cooler
	32	Previous content
8th	33	Electrical circuit for water cooler
	34	Characteristics of good coolant
	35	Problems and discussion
	36	Test and note book checking
	37	Definition of drive Advantages of electric drives
9th	38	Characteristics of different mechanical loads
	39	Types of motors used as electric drive
	40	Electric braking-Plugging, Rheostatic braking , and Regenerative braking
	41	methods of power transfer by direct coupling by using devices like belt drive, gears, chain drives etc.
	42	selection of motors for different types of domestic loads
10th	43	Selection of drive for applications such as general workshop, textile mill, paper mill, steel mill, printing press, crane and lift etc. Application of flywheel.

	44	Specifications of commonly used motors e.g. squirrel cage motors, slip ring induction motors, AC series motors, Fractional kilo Watt(FKW) motors
	45	Selection of motors for Domestic Appliances
	46	Problems and note book checking
	47	chapter test
11th	48	Advantages of electric traction over other types of traction
	49	Different systems of electric traction, DC and AC systems
	50	diesel electric system, types of services
	51	urban, sub-urban, and main line and their speed-time curves
	52	Different accessories for track electrification; such as overhead catenary wire
12th	53	conductor rail system, current collector-pentagraph
	54	Scheduled speed and Factors affecting scheduled speed
	55	Block diagram of locomotive
	56	Types of motors used for electric traction
	57	Power supply arrangements
13th	58	Starting and braking of electric locomotives
	59	Introduction to EMU and metro railways
	60	Train Lighting Scheme
	61	Problems and note book checking
	62	Chapter test