Lesson Plan

Name of the Faculty : Sanjeev Kumar

Discipline : Mechanical Engineering

Semester : 3rd

Subject : **BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING**

Lesson Plan duration : 17 weeks (from 07.09.2020 to 24.12.2020)

Work load per week : Lecture – 03, Practical – 02

Week	Theory		Practical	
	Lecture Day	Topic (Including assessment/test)	Practical Day	Topic
1st	1st	**Unit 1: Application and Advantage of Electricity**	1st	Connection of a three-phase motor and starter with fuses and reversing of direction of rotation
	2nd	Difference between AC and DC supply, various applications of electricity.		
	3rd	Advantages of electrical energy over other types of energy.		
2nd	4th	**Unit 2: Basic Electrical Quantities** : Definition of voltage, current, power and energy with their units, Name of instruments used for measuring above quantities.	2nd	Connection of a single-phase induction motor with supply and reversing of its direction of rotation
	5th	connection of these instruments in an electric circuit.		
	6th	**Unit 3: AC Fundamentals** : Electromagnetic induction-Faraday's Laws, Lenz's Law		
3rd	7th	Fleming's rules, Principles of a.c. Circuits; Alternating emf	3rd	Troubleshooting in domestic wiring system, including distribution board
	8th	Definition of cycle, frequency, amplitude and time period. Instantaneous, average		
	9th	r.m.s and maximum value of sinusoidal wave; form factor and Peak Factor. Concept of phase and phase difference		
4th	10th	Concept of resistance,inductance,capacitance in	4th	Checking of Experiments

		simple ac circuit		
	11th	Power factor and improvement of power factor by use of capacitors		
	12th	Concept of three phase system :Star and delta connections; voltage and current relationship (no derivation)		
5th	13th	**Unit 4: Transformers :**Working principle and construction of single phase transformer, transformer ratio	5th	Connection and reading of an electric energy meter
	14th	Emf equation, losses and efficiency		
	15th	Cooling of transformers, isolation transformer,		
6th	16th	CVT, auto transformer (brief idea), applications	6th	Use of ammeter, voltmeter, wattmeter, and multi-meter
	17th	**Unit 5: Distribution System** : Difference between high and low voltage distribution system		
	18th	Identification of three-phase wires, neutral wire and earth wire in a low voltage distribution system		
7th	19th	Identification of voltages between phases and between one phase and neutral	7th	Measurement of power and power factor in a given single phase ac circuit
	20th	Difference between three-phase and single-phase supply		
	21st	**Unit 6: Electric Motor**: Description and applications of single-phase and three phase motors		
8th	22nd	**1st sessional test (Tentative)**	8th	Checking of Experiments
	23rd	**Assessment**		
	24th	Working of single phase and three-phase motors		
9th	25th	Connection and starting of three-phase induction motors by star-delta starter	9th	Study of different types of fuses, MCBs and ELCBs
	26th	Changing direction of rotation of a given 3 phase induction motor		
	27th	Motors used for driving pumps		
10th	28th	Motors used for compressors, centrifuge, dyers etc	10th	Study of zener diode as a constant voltage source and to draw its V-I characteristics
	29th	Totally enclosed submersible and flame proof motors		
	30st	**Unit 7: Domestic Installation:** Distinction between light-fan circuit and single phase power circuit, sub-circuits		
11th	31st	various accessories and parts of domestic electrical installation	11th	Study of earthing practices
	32nd	Identification of wiring systems.		

		Common safety measures and earthing		
	33rd	**Unit 8: Electrical Safety:** Electrical shock and precautions against shock,		
12th	34th	treatment of electric shock	12th	Checking of Experiments
	35th	Concept of fuses and their classification, selection and application		
	36th	**2nd sessional test (Tentative)**		
13th	37th	**Assessment**	13th	To draw V-I characteristics of a (i) NPN transistor (ii) Thyristor (SCR)
	38th	Concept of earthing and various types of earthing, applications of MCBs and ELCBs		
	39th	**Unit 9: Basic Electronics:** Basic idea of semiconductors – P and N type		
14th	40th	Diodes : zener diodes and their applications	14th	Study of construction and working of a (i) stepper motor
	41st	Transistor – PNP, their characteristics and uses		
	42nd	Transistor –NPN, their characteristics and uses		
15th	43rd	Characteristics and applications of a thyristor	15th	Study of construction and working of a (ii) Servo motor
	44th	characteristics and applications of stepper motorsin process control		
	45th	characteristics and applications of servo motors in process control		
16th	46th	Revision	16th	Checking of Experiments
	47th	Revision		
	48th	**3rd sessional test (Tentative)**		
17th	49th	**Assessment**	17th	Internal Viva
	50th	Revision		
	51st	Revision		