Discipline:- Electrical	Semester:- 5th	Name Of The Teaching Faculty:- Pradeep kumar Mohanty
Subject:- Power electronics & PLC	No Of Days Per week Class Allotted:-4	No Of Weeks:-15 Date:-1/7/24-16/12/24
No. of week	No. of class	Topic to be taught
1st	1	UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES Construction, Operation, V-I characteristics & application of power diode
	2	Construction, Operation, V-I characteristics & application of SCR
	3	Construction, Operation, V-I characteristics & application of DIAC
	4	Construction, Operation, V-I characteristics & application of TRIAC
2nd	5	Construction, Operation, V-I characteristics & application of MOSFET
	6	Construction, Operation, V-I characteristics & application of GTO &IGBT
	7	Two transistor analogy of SCR.
	8	Gate characteristics of SCR.
3rd	9	Switching characteristic of SCR during turn on and turn off.
	10	Turn on methods of SCR.
	11	Turn off methods of SCR
	12	Load Commutation
4th	13	Resonant pulse commutation
	14	Voltage and Current ratings of SCR.
	15	Protection of SCR Over voltage protection, Over current protection, Gate protection
	16	Firing Circuits, General layout diagram of firing circuit, R firing circuits, R-C firing circuit
5th	17	UJT pulse trigger circuit Synchronous triggering
	18	Design of Snubber Circuits
	19	UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS. Controlled rectifiers Techniques
	20	Single quadrant semi converter
6th	21	two quadrant full converter and dual Converter
	22	Working of single-phase half wave controlled converter with Resistive and R-L loads.
	23	Understand need of freewheeling diode.
	24	Working of single phase fully controlled converter with resistive and R- L loads.
7th	25	Working of three-phase half wave controlled converter with Resistive load
	26	Working of three phase fully controlled converter with resistive load.
	27	Working of single phase AC regulator.
	28	Working principle of step up & step down chopper.

8th	29	Control modes of chopper
	30	Operation of chopper in all four quadrants.
	31	UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS and Classify inverters.
	32	Explain the working of series inverter.
9th	33	Explain the working of parallel inverter
	34	Explain the working of single-phase bridge inverter.
	35	Explain the basic principle of Cyclo-converter.
	36	Explain the working of single-phase step up step down
10th	37	step down Cyclo-converter. Applications of Cyclo-converter.
	38	Question discussion
	39	. UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS, List applications of power electronic circuits.
	40	List the factors affecting the speed of DC Motors.
11th	41	Speed control for DC Shunt motor using converter.
	42	Speed control for DC Shunt motor using chopper.
	43	List the factors affecting speed of the AC Motors.
	44	Speed control of Induction Motor by using AC voltage regulator.
12th	45	Speed control of induction motor by using converters and inverters (V/F control).
	46	Working of UPS with block diagram.
	47	Battery charger circuit using SCR with the help of a diagram.
	48	Basic Switched mode power supply (SMPS) - explain its working & applications
	49	PLC AND ITS APPLICATIONS, Introduction of Programmable Logic Controller(PLC)
13th	50	Advantages of PLC, Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.
	51	Applications of PLC, Ladder diagram
	52	Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output iv)latched Output v) branching
14th	53	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.
	54	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT
	55	Timers-i)T ON ii) T OFF and iii)Retentive timer 5.10 Counters-CTU, CTD
	56	Ladder diagrams using Timers and counters
15th	57	PLC Instruction set
	58	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller
	59	Special control systems- Basics DCS & SCADA systems
	60	Computer Control–Data Acquisition, Direct Digital Control System (Basics only) and question discussion.

P. Mohan
1/7/24

Teacher's signature

HOD, EE 07/2024