PNS SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING

Branch: Electrical & ETC Engg.	Semester: 5TH	Name of the Lecturer: **Chacha Amitav Tripathy**
Subject: PE&PLC	Classes Alloted in a Week: 5	Duration of Semester: 01.07.2024 - 08.11.2024
Week	Class Day	Theory / Practical Topic
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	1	Construction, Operation, V-I characteristics & application of Power MOSFET
	2	Construction, Operation, V-I characteristics & application of GTO
	3	Construction, Operation, V-I characteristics & application of IGBT
	4	Two transistor analogy of SCR
3rd	1	Gate characteristics of SCR.
	2	Switching characteristic of SCR during turn on and turn off.
	3	Turn on methods of SCR.
	4	Turn off methods of SCR (Load Commutation & Resonant pulse commutation)
4th	1	Voltage and Current ratings of SCR.
	2	Protection of SCR Over voltage protection Over current protection Gate protection
	3	Firing Circuits General layout diagram of firing circuit R firing circuits R-C firing circuit
	4	UJT pulse trigger circuit
5th	1	Synchronous triggering (Ramp Triggering)
	2	Design of Snubber Circuits
	3	**UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS:** Controlled rectifiers techniques (Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter.
	4	Working of single-phase half wave controlled converter with Resistive
6th	1	Working of single-phase half wave controlled converter with R-L loads.
	2	Understand need of freewheeling diode.
	3	Working of single phase fully controlled converter with resistive.
	4	Working of single phase fully controlled converter with R- L loads.
7th	1	Working of three-phase half wave controlled converter with Resistive load
	2	Working of three phase fully controlled converter with resistive load.
	3	Working of single phase AC regulator.
	4	Working principle of step up & step down chopper.
8th	1	Control modes of chopper
	2	Operation of chopper in all four quadrants.

8th	3	**UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS:** Classify inverters
	4	Explain the working of series inverter
9th	1	Explain the working of parallel inverter
	2	Explain the working of single-phase bridge inverter
	3	Explain the basic principle of Cyclo-converter
	4	Explain the working of single-phase step up & step down Cyclo-converter.
10th	1	Explain the working of single-phase step up & step down Cyclo-converter.
	2	Applications of Cyclo-converter
	3	**UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS:** List applications of power electronic circuits
	4	List the factors affecting the speed of DC Motors
11th	1	Speed control for DC Shunt motor using converter
	2	Speed control for DC Shunt motor using chopper
	3	List the factors affecting speed of the AC Motors
	4	Speed control of Induction Motor by using AC voltage regulator
12th	1	Speed control of induction motor by using converters and inverters (V/F control)
	2	Working of UPS with block diagram
	3	Battery charger circuit using SCR with the help of a diagram
	4	Basic Switched mode power supply (SMPS) - explain its working & applications
13th	1	**PLC AND ITS APPLICATIONS:** Introduction of Programmable Logic Controller(PLC). Advantages of PLC
	2	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC
	3	Applications of PLC, Ladder diagram
	4	Description of contacts and coils in the following states i)Normally open ii)Normally closed iii) Energized output iv)latched Output v) branching
14th	1	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate
	2	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT
	3	Timers-i)T ON ii) T OFF and iii)Retentive timer, Counters-CTU, CTD
	4	Ladder diagrams using Timers and counters
15th	1	PLC Instruction set
	2	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller
	3	Special control systems- Basics DCS & SCADA systems
	4	Computer Control–Data Acquisition, Direct Digital Control System (Basics only)

Signature of the Lecturer

Signature of the H.O.D.

Signature of the Principal