

Discipline-Electrical Engg/ETC	Semester-5th	Name of the teaching faculty- Er. Siba Ranjan Nayak
Subject-Power electronics	No of days/week class allotted-4	Semester from- No of weeks-15
Week	Class day	Theory topic
1	1st	Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC, TRIAC, Power MOSFET, GTO & IGBT.
	2nd	Two transistor analogy of SCR, Gate characteristics of SCR
	3rd	Switching characteristics of SCR during turn on and turn off, Turn on methods of SCR
	4th	Numerical related to gate turn on and off of MOSFET, BJT
2	1st	Different Commutation techniques (Load commutation, voltage commutation and current commutation)
	2nd	SCR protection (Gate Protection)
	3rd	Voltage protection and current protection
	4th	Firing Circuits (General layout diagram of firing circuit)
3	1st	R firing circuits, R-C firing circuit
	2nd	UJT pulse trigger circuit and Synchronous triggering (Ramp Triggering)
	3rd	Limitations of R and RC firing circuits
	4th	Design of Snubber Circuits and numerical to find the value of R and C.
4	1st	Doubt clearing and revision class
	2nd	Controlled rectifiers Techniques (Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter
	3rd	Working of single-phase half wave controlled converter with Resistive and R-L loads
	4th	Problem solving and realising the waveforms.
5	1st	Understand need of freewheeling diode.
	2nd	Working of single phase fully controlled converter with resistive and R-L loads.
	3rd	Working of three-phase half wave controlled converter with Resistive load
	4th	Working of three phase fully controlled converter with resistive load.
6	1st	Doubt clearing and problem solving

	2nd	Working of single phase AC regulator.
	3rd	Working principle of stepup & stepdown chopper
	4th	Control modes of chopper
7	1st	Operation of chopper in all four quadrants
	2nd	UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS. Classify inverters.
	3rd	Explain the working of series inverter
	4th	Explain the working of parallel inverter
8	1st	Explain the working of single-phase bridge inverter.
	2nd	Explain the basic principle of cycloconverter
	3rd	Explain the working of single-phase stepup & stepdown Cyclo-converter
	4th	Applications of Cyclo-converter
9	1st	Problem solving on inverter and chopper
	2nd	UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS. List applications of power electronic circuits
	3rd	List the factors affecting the speed of DC Motors
	4th	Speed control for DC Shunt motor using converter
10	1st	Speed control for DC Shunt motor using chopper
	2nd	List the factors affecting speed of the AC Motors
	3rd	Speed control of Induction Motor by using AC voltage regulator
	4th	Speed control of induction motor by using converters and inverters (V/F control)
11	1st	Working of UPS with block diagram
	2nd	Battery charger circuit using SCR with the help of a diagram
	3rd	Basic Switched mode power supply (SMPS)-explain its working & applications
	4th	Numerical on cyclo-converter
12	1st	PLC AND ITS APPLICATIONS. Introduction of Programmable Logic Controller (PLC)
	2nd	Advantages of PLC
	3rd	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.

	4th	Applications of PLC
13	1st	Different Ladder diagrams
	2nd	Description of contacts and coils in the following states i) Normally open ii) Normally closed iii) Energized output iv) latched Output v) branching
	3rd	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate
	4th	Ladder diagrams for combination circuits using NAND, NOR, AND, OR and NOT
14	1st	Timers- i) TON ii) TOFF and iii) Retentive timer
	2nd	Counters- CTU, CTD
	3rd	Ladder diagrams using Timers and counters
	4th	PLC Instruction set
15	1st	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller
	2nd	Special control systems- Basics DCS & SCADA systems
	3rd	Computer Control- Data Acquisition, Direct Digital Control System (Basic only)
	4th	Doubt Clearance


 Principal
 Orissa School of Engineering
 Barampur (Gm.)


 Sibarangan Nayak


 H.D.D. Electrical Dept.
 O.S.E., Barampur