DISCIPLINE EE/EEE	SEMESTER 5TH	NAME OF THE TEACHING FACULTY Niranjan Nayak (Lect. (S-II) IN AE&I)
SUBJECT POWER ELECTRONICSAND PLC	NO. OF DAYS/WEEK CLASS ALLOTTED - 60	No. of week excluding holiday - 15
WEEK	CLASS DAY	THEORY TOPICS
1ST	1	UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES - Construction, Operation, V-I characteristics & application of power diode.
	2	V-I characteristics & application of SCR, DIAC
	3	V-I characteristics & application of Power MOSFET, TRIAC
	4	V-I characteristics & application of Power GTO &IGBT
2ND	5	Two transistor analogy of SCR. Gate characteristics of SCR.
	6	Switching characteristic of SCR during turn on and turn off. Turn on methods of SCR.
	7	Turn off methods of SCR (Line commutation and Forced commutation) Load Commutation and Resonant pulse commutation
	8	Voltage and Current ratings of SCR
3RD	9	Protection of SCR of Over voltage protection ,Over current protection and Gate protection
	10	Firing Circuits General layout diagram of firing circuit
	11	R firing circuits
	12	R-C firing circuit
4TH	13	UJT pulse trigger circuit
	14	Synchronous triggering (Ramp Triggering)
	15	Design of Snubber Circuits.
	16	Revision of protection and firing circuits of SCR
5TH	17	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter
	18	Working of single-phase half wave controlled converter with Resistive and R-L loads.
	19	Understand need of freewheeling diode.
	20	Working of single phase fully controlled converter with resistive and R- L loads.
6TH	21	Working of three-phase half wave controlled converter with Resistive load.
	22	Working of three phase fully controlled converter with resistive load.
	23	Working of single phase AC regulator.
	24	Working principle of step up & step down chopper
7TH	25	Control modes of chopper
	26	Operation of chopper in all four quadrants
	27	Revision of chopper circuits
	28	Classify inverters.
8TH	29	Explain the working of series inverter.
	30	Explain the working of parallel inverter.
	31	Explain the working of single-phase bridge inverter.
	32	Explain the basic principle of Cyclo-converter.

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