LESSON PLAN

SUB:-POWER ELECTRONICS & PLC.

BRANCH:- ELECTRICAL ENGG.

SEMESTER: 5TH

NAME OF FACULTY: - DHARMENDRA SAHOO

GOVERNMENT POLYTECHNIC, BHADRAK

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Principal
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Principal
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Discipline: ELECTRICAL ENGG.	Semester: 5th	Name of the Teaching Faculty : DHARMENDRA SAHOO
Subject: POWER ELECTRONICS AND PLC	No. of Days/per week class allotted:4	Semester from date: 01.08.2023 To Date: 30.11.2023 No. of Weeks:15
Week	Class Day	Theory
1st	1st	Construction, Operation, V-I characteristics & application of power Diode.
	2nd	Construction, Operation, V-I characteristics & application of SCR
	3rd	Construction, Operation, V-I characteristics & application of DIAC & TRIAC
	4th	Construction, Operation, V-I characteristics & application of Power MOSFET
2nd	1st	Construction, Operation, V-I characteristics & application of GTO & IGBT
	2nd	Two transistor analogy of SCR..
	3rd	Gate characteristics of SCR.
	4th	Switching characteristic of SCR during turn on and turn off.
3rd	1st	Turn on methods of SCR..
	2nd	Turn off methods of SCR (Line commutation and Forced commutation)
	3rd	Load Commutation Resonant pulse commutation
	4th	Voltage and Current ratings of SCR
4th	1st	Protection of SCR Over voltage protection
	2nd	Over current protection Gate protection
	3rd	Firing Circuits and General layout diagram of firing circuit 1.
	4th	R firing circuits and R-C firing circuit.
5th	1st	UJT pulse trigger circuit and Synchronous triggering (Ramp Triggering.
	2nd	Design of Snubber Circuits and chapter revision
	3rd	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control),
	4th	Single quadrant semi converter, two quadrant full converter and dual Converter.
6th	1st	Working of single-phase half wave controlled converter with Resistive
	2nd	Working of single-phase half wave controlled converter with R-L loads and Understand need of freewheeling diode.

	3rd	Working of three-phase half wave controlled converter with Resistive load
	4th	Working of three-phase fully wave controlled converter with Resistive load
7th	1st	Working of single phase AC regulator
	2nd	Working principle of step up chopper
	3rd	Working principle of step down chopper
	4th	Control modes of chopper
8th	1st	Operation of chopper in all four quadrants
	2nd	Class test of ch-1 and ch-2
	3rd	Classify inverters
	4th	Explain the working of series inverter
9th	1st	Explain the working of parallel inverter
	2nd	Explain the working of single-phase bridge inverter
	3rd	Explain the basic principle of Cyclo-converter
	4th	Explain the working of single-phase step up Cyclo-converter
10th	1st	Explain the working of single-phase step down Cyclo-converter
	2nd	
	3rd	List applications of power electronic circuits
	4th	List the factors affecting the speed of DC Motors
11th	1st	Speed control for DC Shunt motor using converter
	2nd	Speed control for DC Shunt motor using chopper
	3rd	List the factors affecting speed of the AC Motors.
	4th	Speed control of Induction Motor by using AC voltage regulator
12th	1st	Speed control of induction motor by using converters and inverters (V/F control)
	2nd	Working of UPS with block diagram
	3rd	Battery charger circuit using SCR with the help of a diagram.
	4th	Basic Switched mode power supply (SMPS) - explain its working & applications
13th	1st	Introduction of Programmable Logic Controller(PLC) Advantages of PLC
	2nd	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC
	3rd	Applications of PLC Ladder diagram
	4th	Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output iv)latched Output v) branching
14th	1st	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.

	2nd	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT
	3rd	Timers-i)T ON ii) T OFF and iii)Retentive timer
	4th	Counters-CTU, CTD
15th	1st	Ladder diagrams using Timers and counters And PLC Instruction set
	2nd	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller
	3rd	Special control systems- Basics DCS & SCADA systems Computer Control–Data Acquisition, Direct Digital Control System (Basics only)
	4th	Previous year question discussions

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