GOVERNMENT POLYTECHNIC ,NAYAGARH
Department Of Electrical Engineering

Semester: 5TH DIPLOMA
Subject: Power Electronics (Theory)
Branch: Electrical Engineering,

Session: 2025-26
No Of Period :60 (4p/week)
Name of Faculty: Satyabrata Sahoo

Week	Period	Topics to be covered
14/07/2025 to 19/07/2025	1	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
21/07/2025 to 25/07/2025	5	Construction, Operation, V-I characteristics & application of Power MOSFET
	6	Construction, Operation, V-I characteristics & application of GTO
	7	Construction, Operation, V-I characteristics & application of IGBT
	8	Two transistor analogy of SCR, Gate characteristics of SCR.
28/08/2025 to 2/08/2025	9	Switching characteristic of SCR during turn on and turn off, Turn on methods of SCR.
	10	Turn on methods of SCR.
	11	-do-
	12	Turn off methods of SCR (Line commutation and Forced commutation)
4/08/2025 to 8/08/2025	13	-do-
	14	Voltage and Current ratings of Thyristor.
	15	Protection of Thyristor
	16	Firing Circuits (General layout diagram, R-fring circuits, Rc-frirng circuits)
11/08/2025 to 16/08/2025	17	Uni-junction Transistor (Basic operation),Synchronous triggering
	18	Design of snubber circuits
	19	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter
	20	-do-
18/08/2025 To 22/08/2025	21	Working of single-phase half wave controlled converter with Resistive and R-L loads
	22	Understand need of freewheeling diode.
	23	Working of single phase fully controlled converter with resistive and R- L loads
	24	Working of three-phase half wave controlled converter with Resistive load
25/08/2025 To 30/08/2025	25	Working of three phase fully controlled converter with resistive load
	26	-do-
	27	Working of single phase AC regulator.
	28	Working principle of step up & step down chopper.
1/09/2025 To 6/09/2025	29	Control modes of chopper, Operation of chopper in all four quadrants
	30	Classify inverters. Explain the working of series inverter.
	31	Explain the working of parallel inverter
	32	Explain the working of single-phase bridge inverter
8/09/2025	33	Explain the basic principle of Cyclo-converter

To 12/09/2025	34	Explain the working of single-phase step up Cyclo-converter
	35	Explain the working of single-phase step down Cyclo-converter
	36	Applications of Cyclo-converter.
15/09/2025 To 20/09/2025	37	List applications of power electronic circuits. 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. Speed control of Induction Motor by using AC voltage regulator.
22/09/2025 To 26/09/2025	41	-do-
	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.
6/10/2025 To 10/10/2025	45	Basic Switched mode power supply (SMPS) - explain its working & applications
	46	-do-
	47	Introduction of Programmable Logic Controller(PLC)
	48	Advantages of PLC , Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.
13/10/2025 To 18/10/2025	49	Applications of PLC
	50	Ladder diagram, Description of contacts and coils in the following states i)Normally open ii) Normally closed
	51	Description of contacts and coils in the following states iii) Energized output iv)latched Output v) branching
	52	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.
20/10/2025 To 24/10/2025	53	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT
	54	Timers-i)T ON ii) T OFF and iii)Retentive timer
	55	Counters-CTU, CTD, Ladder diagrams using Timers and counters
	56	PLC Instruction set
27/10/2025 To 1/11/2025	57	Ladder diagrams for (i) DOL starter and STAR-DELTA starter
	58	Ladder diagrams for (ii) Stair case lighting (iii) Traffic light Control(iv) Temperature Controller
	59	Special control systems- Basics DCS & SCADA systems, Computer Control–Data Acquisition, Direct Digital Control System (Basics only)
	60	Previous Question Discussion
3/11/2025 to 15/11/2025		Previous Question Discussion

Signature of Faculty

Signature of HOD