GANDHI SCHOOL OF ENGINEERING

BHABANDHA, BERHAMPUR

BRANCH:- ELECTRICAL ENGINEERING

SEMESTER:- 5TH

SUBJECT:- PE &PLC

GROUP- 1&2

Name of the Faculty- ER.MONALISA GOUDA & ER. RABINDRA DAS

			Topic to be taken			Actual topic taken		
Sl. No	**Topic/Module**	**No. of period**	**Details of the topics**	**Date**	**Topic No.**	**Topic Name**	**Date**	**Remarks**
1	UNDERSTAND THE CONSTRUCTION AND WORKING OF POWER ELECTRONIC DEVICES	18	1.1 Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC,TRIAC, Power MOSFET,GTO &IGBT 1.2 Two transistor analogy of SCR. 1.3 Gate characteristics of SCR. 1.4 Switching characteristic of SCR during turn on and turn off. 1.5 Turn on methods of SCR. 1.6 Turn off methods of SCR (Line commutation and Forced commutation) 1.6.1 Load Commutation 1.6.2 Resonant pulse commutation 1.7 Voltage and Current ratings of SCR.	**08.08.2023 TO 29.08.2023**	**1.1** **1.2** **1.3** **1.4** **1.5** **1.6** **1.7** **1.8** **1.8.1** **1.8.2** **1.8.3** **1.9** **1.9.1**	Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC,TRIAC, Power MOSFET,GTO &IGBT Two transistor analogy of SCR. Gate characteristics of SCR. Switching characteristic of SCR during turn on and turn off. Turn on methods of SCR. Turn off methods of SCR (Line commutation and Forced commutation) Load Commutation	08.08.2023 09.08.2023 10.08.2023 11.08.2023 12.08.2023 14.08.2023 16.08.2023 17.08.2023 18.08.2023 19.08.2023 21.08.2023 22.08.2023 23.08.2023 24.08.2023 25.08.2023 26.08.2023	

			1.8 Protection of SCR 1.8.1 Over voltage protection 1.8.2 Over current protection 1.8.3 Gate protection 1.9 Firing Circuits 1.9.1 General layout diagram of firing circuit 1.9.2 R firing circuits 1.9.3 R-C firing circuit 1.9.4 UJT pulse trigger circuit 1.9.5 Synchronous triggering (Ramp Triggering) 1.10 Design of Snubber Circuits		**1.9.2** **1.9.3** **1.9.4** **1.9.5** **1.10**	Resonant pulse commutation Voltage and Current ratings of SCR. Protection of SCR Over voltage protection Over current protection Gate protection Firing Circuits General layout diagram of firing circuit R firing circuits R-C firing circuit UJT pulse trigger circuit Synchronous triggering (Ramp Triggering) Design of Snubber Circuits	28.08.2023 29.08.2023	
2	UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS	**12**	2.1 Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter 2.2 Working of single-phase half wave controlled converter with Resistive and R-L loads. 2.3 Understand need of freewheeling diode. 2.4 Working of single phase fully controlled converter with resistive and R- L loads. 2.5 Working of three-phase half wave controlled converter with Resistive load 2.6 Working of three phase fully	**31.08.2023 TO 13.09.2023**	**2.1** **2.2** **2.3** **2.4** **2.5** **2.6** **2.6** **2.7**	Controlled rectifiers Techniques(Phase Angle, Extinction Angle control), Single quadrant semi converter, two quadrant full converter and dual Converter Working of single-phase half wave controlled converter with Resistive and R-L loads. Understand need of freewheeling diode. Working of single phase fully controlled converter with resistive and R- L loads. Working of three-phase half	31.08.2023 01.09.2023 04.09.2023 07.09.2023 11.09.2023 12.09.2023 13.09.2023	

			controlled converter with resistive load. 2.7 Working of single phase AC regulator. 2.8 Working principle of step up & step down chopper. 2.9 Control modes of chopper 2.10 Operation of chopper in all four quadrants		**2.8** **2.9** **2.10**	wave controlled converter with Resistive load Working of three phase fully controlled converter with resistive load. Working of single phase AC regulator. Working principle of step up & step down chopper. Control modes of chopper Operation of chopper in all four quadrants	14.09.2023 15.09.2023 16.09.2023 21.09.2023 22.09.2023	
3	UNDERSTAND THE INVERTERS AND CYCLO-CONVERTERS	**08**	3.1 Classify inverters 3.2 Explain the working of series inverter. 3.3 Explain the working of parallel inverter 3.4 Explain the working of single-phase bridge inverter. 3.5 Explain the basic principle of Cyclo-converter. 3.6 Explain the working of single-phase step up & step down Cyclo-converter. 3.7 Applications of Cyclo-converter	**23.09.2023 TO 03.10.2023**	**3.1** **3.2** **3.3** **3.4** **3.5** **3.6** **3.7**	Classify inverters Explain the working of series inverter. Explain the working of parallel inverter Explain the working of single-phase bridge inverter. Explain the basic principle of Cyclo-converter. Explain the working of single-phase step up & step down Cyclo-converter. Applications of Cyclo-converter	23.09.2023 25.09.2023 26.09.2023 27.09.2023 29.09.2023 30.09.2023 31.09.2023 03.10.2023	
4	UNDERSTAND APPLICATIONS OF POWER ELECTRONIC CIRCUITS	**10**	4.1 List applications of power electronic circuits. 4.2 List the factors affecting the speed of DC Motors. 4.3 Speed control for DC Shunt motor using converter.	**04.10.2023 TO 18.10.2023**	**4.1** **4.2** **4.3** **4.4** **4.5**	List applications of power electronic circuits. List the factors affecting the speed of DC Motors. Speed control for DC Shunt motor using converter.	04.10.2023 06.10.2023 07.10.2023 09.10.2023 10.10.2023 11.10.2023	

			4.4 Speed control for DC Shunt motor using chopper. 4.5 List the factors affecting speed of the AC Motors. 4.6 Speed control of Induction Motor by using AC voltage regulator. 4.7 Speed control of induction motor by using converters and inverters (V/F control). 4.8 Working of UPS with block diagram. 4.9 Battery charger circuit using SCR with the help of a diagra		**4.6** **4.7** **4.8** **4.9**	Speed control for DC Shunt motor using chopper. List the factors affecting speed of the AC Motors. Speed control of Induction Motor by using AC voltage regulator. Speed control of induction motor by using converters and inverters (V/F control). Working of UPS with block diagram. Battery charger circuit using SCR with the help of a diagram	12.10.2023 13.10.2023 14.10.2023 16.10.2023 17.10.2023 18.10.2023	
5	PLC AND ITS APPLICATIONS	**12**	5.1 Introduction of Programmable Logic Controller(PLC) 5.2 Advantages of PLC 5.3 Different parts of PLC by drawing the Block diagram and purpose of each part of PLC. 5.4 Applications of PLC 5.5 Ladder diagram 5.6 Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output iv)latched Output v) branching 5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate. 5.8 Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT 5.9 Timers-i)T ON ii) T OFF and	**17.10.2023** **TO** **15.11.2023**	**5.1** **5.2** **5.3** **5.4** **5.5** **5.6** **5.7** **5.8** **5.9** **5.10** **5.11**	Introduction of Programmable Logic Controller(PLC) Advantages of PLC Different parts of PLC by drawing the Block diagram and purpose of each part of PLC. Applications of PLC 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 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.	17.10.2023 18.10.2023 02.11.2023 03.11.2023 04.11.2023 06.11.2023 07.11.2023 08.11.2023	

			iii)Retentive timer 5.10 Counters-CTU, CTD 5.11 Ladder diagrams using Timers and counters 5.12 PLC Instruction set 5.13 Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller 5.14 Special control systems- Basics DCS & SCADA systems 5.15 Computer Control–Data Acquisition, Direct Digital Control System (Basics only)		**5.12** **5.13** **5.14** **5.15**	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT Timers-i)T ON ii) T OFF and iii)Retentive timer Counters-CTU, CTD Ladder diagrams using Timers and counters PLC Instruction set Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (iv) Temperature Controller Special control systems- Basics DCS & SCADA systems Computer Control–Data Acquisition, Direct Digital Control System (Basics only)	09.11.2023 10.11.2023 11.11.2023 15.11.2023	

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