



GANDHI SCHOOL OF ENGINEERING

BHABANDHA, BERHAMPUR

BRANCH:- ELECTRICAL ENGINEERING

SEMESTER:- 5TH

SUBJECT:- PE & PLC

Name of the Faculty- ER MONALISA GOUDA & ER.SIDHARTH SAMNTARAY

			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. 1.8 Protection of SCR	20.09.2022 To 15.10.2022	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 Resonant pulse	20.09.2022 22.09.2022 27.09.2022 28.09.2022 29.09.2022 11.10.2022 13.10.2022 15.10.2022	

			<p>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</p>		<p>1.9.2 1.9.3 1.9.4 1.9.5 1.10</p>	<p>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</p>	
2	UNDERSTAND THE WORKING OF CONVERTERS, AC REGULATORS AND CHOPPERS	12	<p>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 controlled converter with resistive</p>	17.10.2022 TO 03.11.2022	<p>2.1 2.2 2.3 2.4 2.5 2.6 2.6 2.7</p>	<p>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 wave controlled converter</p>	<p>17.10.2022 18.10.2022 22.10.2022 21.10.2022 26.10.2022 27.10.2022 01.11.2022 03.11.2022</p>

			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	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		
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	05.11.2022 TO 24.11.2022	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	05.11.2022 10.11.2022 12.11.2022 14.11.2022 15.11.2022 17.11.2022 21.11.2022 24.11.2022	
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.	26.11.2022 TO 15.12.2022	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.	26.11.2022 02.12.2022 05.12.2022 07.12.2022	

			<p>4.4 Speed control for DC Shunt motor using chopper.</p> <p>4.5 List the factors affecting speed of the AC Motors.</p> <p>4.6 Speed control of Induction Motor by using AC voltage regulator.</p> <p>4.7 Speed control of induction motor by using converters and inverters (V/F control). 4.8 Working of UPS with block diagram.</p> <p>4.9 Battery charger circuit using SCR with the help of a diagra</p>		<p>4.6</p> <p>4.7</p> <p>4.8</p> <p>4.9</p>	<p>Speed control for DC Shunt motor using chopper.</p> <p>List the factors affecting speed of the AC Motors.</p> <p>Speed control of Induction Motor by using AC voltage regulator.</p> <p>Speed control of induction motor by using converters and inverters (V/F control). Working of UPS with block diagram.</p> <p>Battery charger circuit using SCR with the help of a diagram</p>	<p>08.12.2022</p> <p>09.12.2022</p> <p>09.12.2022</p> <p>10.12.2022</p> <p>12.12.2022</p> <p>14.12.2022</p> <p>15.12.2022</p> <p>15.12.2022</p>	
5	PLC AND ITS APPLICATIONS	12	<p>5.1 Introduction of Programmable Logic Controller(PLC)</p> <p>5.2 Advantages of PLC</p> <p>5.3 Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.</p> <p>5.4 Applications of PLC</p> <p>5.5 Ladder diagram</p> <p>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</p> <p>5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.</p> <p>5.8 Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT</p> <p>5.9 Timers-i)T ON ii) T OFF and</p>	<p>16.12.2022</p> <p>TO</p> <p>10.01.2023</p>	<p>5.1</p> <p>5.2</p> <p>5.3</p> <p>5.4</p> <p>5.5</p> <p>5.6</p> <p>5.7</p> <p>5.8</p> <p>5.9</p> <p>5.10</p> <p>5.11</p>	<p>Introduction of Programmable Logic Controller(PLC)</p> <p>Advantages of PLC</p> <p>Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.</p> <p>Applications of PLC</p> <p>Ladder diagram</p> <p>Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output iv)latched Output v) branching</p> <p>Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.</p>	<p>16.12.2022</p> <p>17.12.2022</p> <p>19.12.2022</p> <p>21.12.2022</p> <p>21.12.2022</p> <p>22.12.2022</p> <p>23.12.2022</p> <p>03.01.2023</p> <p>05.01.2023</p>	

		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)	09.01.2023 10.01.2023	
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