

BHARAT INSTITUTE OF ENGINEERING & TECHNOLOGY

SIVARAM VIHAR, GHATAKESWAR HILLS
MOHADA, BERHAMPUR (GM.)



STUDENT'S ATTENDANCE REGISTER

Time	9-55	11-35	10-45	9-55
Day	10-45	12-25	11-35	10-45
Mon	PE & PLC			
Tue		PE & PLC		
Wed				
Thu				
Fri			PE & PLC	
Sat				PE & PLC

Year/ Session : 2023 (winter)	Semester from Date: 01/08/2023 To Date : 30/11/2023
Semester & Branch	5 th Sem & Electrical Engg. Branch
Subject with Code	Power Electronics & PLC (Th.5)
Name of the Faculty Member	Er. K. Srinivas
No of Weeks:	No of Class Allotted/Week : 04

B.I.E.T., COURSE PLAN

Month	Week	Class Day	Theory/Practical Topic	
AUGUST	01	01/08/23	<u>Ch:1:</u> Understand the construction and working of Power electronic devices: <u>1.1:</u> Construction, operation, v-I characteristics & application of	
		02/08/23	{ <ul style="list-style-type: none"> → Power Diode → SCR 	
		04/08/23	{ <ul style="list-style-type: none"> → DIAC → TRIAC 	
			05/08/23	→ Power MOSFET
	02		07/08/23	→ GTO → IGBT
			08/08/23	<u>1.2:</u> Two transistor Analogy.
			11/08/23	<u>1.3:</u> Gate characteristics of SCR.

Signature of the Faculty:

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Aradyan
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B.I.E.T., COURSE PLAN

Month	Week	Class Day	Theory/Practical Topic
AUGUST	02	12/08/23	<u>1.4</u> : Switching characteristics of SCR during turn on and turn off.
	03	14/08/23	<u>1.5</u> : Turn ON methods of SCR.
		28/08/23	<u>1.6</u> : Turn off methods of SCR. of Line commutation of forced commutation
		29/08/23	<u>1.6.1</u> : Load commutation. <u>1.6.2</u> : Resonant pulse commutation.
	04	21/08/23	<u>1.7</u> : Voltage & current ratings of SCR.
		22/08/23	<u>1.8</u> : <u>Protection of SCR.</u> <u>1.8.1</u> : Over voltage protection

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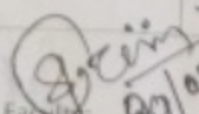
Month	Week	Class Day	Theory/Practical Topic
AUGUST	04	25/08/23	1.8.2: Over current protection 1.8.3: Gate protection 1.9: <u>Firing Circuits:</u>
		26/08/23	1.9.1: General layout diagram of firing circuit.
	05	28/08/23	1.9.2: R Firing Circuits: 1.9.3: R-C Firing circuit.
		29/08/23	1.9.4: UJT pulse trigger circuit.
SEPTEMBER		01/09/23	1.9.5: Synchronous triggering (Ramp triggering)
		02/09/23	1.10: Design of inverter circuits.

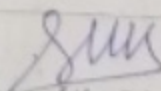
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Month	Week	Class Day	Theory/Practical Topic
SEPTEMBER	06		<p><u>Ch: 2:</u> Understand the working of <u>Converters</u>, <u>AC regulators</u> and <u>Choppers</u>.</p>
		04/09/23	<p><u>2.1:</u> Controlled rectifiers Techniques (Phase Angle, Extinction Angle control)</p> <ul style="list-style-type: none"> → Single quadrant converter → Semi quadrant converter → Two quadrant converter → Dual converter.
		05/09/23	<p><u>2.2:</u> Working of single-phase half wave controlled converter with resistive and R-L load.</p>
		08/09/23	<p><u>2.3:</u> Understand need of freewheeling diode.</p>
		09/09/23	<p><u>2.4:</u> Working of 1ϕ fully controlled converter with resistive & R-L load.</p>


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Month	Week	Class Day	Theory/Practical Topic
SEPTEMBER	07	12/09/23	<u>2.5</u> : Working of 3ϕ half wave controlled converter with Resistive load.
		15/09/23	<u>2.6</u> : Working of 3ϕ fully controlled converter with Resistive load.
		16/09/23	<u>2.7</u> : Working of 1ϕ AC regulator.
	08	18/09/23	<u>2.8</u> : Working of step up & step down chopper.
		22/09/23	<u>2.9</u> : Control modes of chopper.
		23/09/23	<u>2.10</u> : Operation of chopper in all four quadrants.

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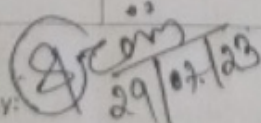
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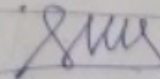
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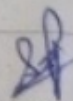
Month	Week	Class Day	Theory/Practical Topic
SEPTEMBER	09	25/09/23	<p><u>Ch: 3</u>: Understand the <u>inverters and cycloconverters</u>.</p> <p><u>3.1</u>: Classify Converters.</p> <p><u>3.2</u>: Explain the working of Series inverter.</p>
		26/09/23	<u>3.3</u> : Explain the working of parallel inverter.
		30/09/23	<u>3.4</u> : Explain the working of 1 ϕ bridge inverter.
OCTOBER	10	03/10/23	<u>3.5</u> : Explain the basic principle of cyclo-converter.
		06/10/23 07/10/23	<u>3.6</u> : Explain the working of 1 ϕ step up & step down cyclo-converter.
	11	09/10/23	<u>3.7</u> : Application of cyclo-converter.

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Month	Week	Class Day	Theory/Practical Topic
OCTOBER	11	10/10/23	Ch: 4: <u>Understand applications of Power electronic circuits.</u>
		13/10/23	4.1: List application of power electronics circuits.
		16/10/23	4.2: List the factors affecting the speed of DC Motors.
	12	17/10/23	4.3: Speed control of DC Shunt motor using converter.
		30/10/23	4.4: Speed control of DC Shunt motor using chopper.
		31/10/23	4.5: List the factors affecting speed of the AC Motors.
NOVEMBER	13	01/11/23	4.6: Speed control of Induction motor by using AC voltage regulator.
		03/11/23	4.7: Speed control of Induction motor by using converters and inverters. (voltage & frequency control)
		04/11/23	4.8: Working of UPS with block diagram..
		06/11/23	4.9: Battery charger circuit using SCR with the help of a diagram.
	07/11/23	4.10: Basic Switched mode power supply (SMPS) explain its working & application.	

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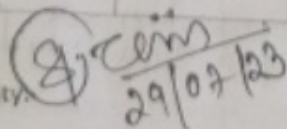
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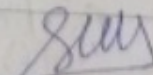
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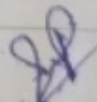
Month	Week	Class Day	Theory/Practical Topic
NOVEMBER	14	10/11/23	<u>Ch: 5: PLC & its Applications.</u> <u>5.1: Introduction of Programmable logic controller (PLC)</u> <u>5.2: Advantages of PLC.</u>
		11/11/23	<u>5.3: Different Parts of PLC by drawing the block diagram & purpose of each part of PLC.</u> <u>5.4: Application of PLC</u> <u>5.5: Ladder diagram.</u>
		13/11/23	<u>5.6: Description of Contacts and coils in the following states.</u> ↪ Normally open ↪ Normally closed ↪ Energized output

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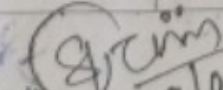
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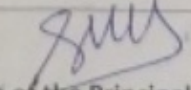





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Month	Week	Class Day	Theory/Practical Topic
NOVEMBER	15		<ul style="list-style-type: none"> → Latched output → Branching.
			<p>14/11/23</p> <p><u>5.7:</u> Ladder diagrams for</p> <ul style="list-style-type: none"> i) AND Gate ii) OR Gate iii) NOT Gate
		<p>17/11/23</p> <p><u>5.8:</u> Ladder diagrams for combination circuits using NAND, NOR, AND, OR, NOT.</p>	
	<p>18/11/23</p> <p><u>5.9:</u> Timers - i) T ON ii) T OFF iii) Retentive timer.</p>		
16			<p><u>5.10:</u> Counters - CTO, CTD</p> <p><u>5.11:</u> Ladder diagrams using Timers & Counters.</p>

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NOVEMBER	16	21/11/23	<u>S.12</u> : PLC instruction Set <u>S.13</u> : Ladder Diagrams for following (i) DOL Starter & Star/Delta Starter (ii) Stair case Lighting (iii) Traffic Light Control (iv) Temperature Control
		24/11/23	
		25/11/23	<u>S.14</u> : Special Control System - Basic DCS & SCADA System.
	17	28/11/23	<u>S.15</u> : Computer Control - Data Acquisition, Direct Digital Control system (Basics only)

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