BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

DEPARTMENT OF ELECTRICAL ENGINEERING

SUBJECT : POWER ELECTRONICS AND PLC **ACADEMIC SESSION: 2024-25**

SEMESTER: 5TH **SECTION: C**

FACULTY : MANJUSHREE MOHAPATRA

Discipline: Electrical Engg.	**Semester:5th (C)**	**Semester: From Date: 01/07/2024 To Date: 08/11/2024** **No. of weeks: 18 WEEKS**
Subject- POWER ELECTRONICS & PLC (TH-5)	**No. of Days/per week class allotted:04 PERIODS/WEEK (MON,TUE,WED,FRI-1 Period Each)**	
Week	**Class Day**	**Theory/Practical Topics**
1st (01/07/2024-06/07/2024)	01/07/2024	**1.Understand the construction & working of power electronic devices** 1.1 Introduction to power electronics
	02/07/2024	1.1 Construction, Operation, V-I characteristics & application of power diode
	03/07/2024	1.1 Construction, Operation, V-I characteristics & application of SCR
	05/07/2024	1.1 Construction, Operation, V-I characteristics & application of DIAC
2nd (08/07/2024-13/07/2024)	09/07/2024	1.1 Construction, Operation, V-I characteristics & application of TRIAC
	10/07/2024	1.1 Construction, Operation, V-I characteristics & application of power MOSFET
	12/07/2024	1.1 Construction, Operation, V-I characteristics & application of IGBT & GTO
3rd (15/07/2024-20/07/2024)	15/07/2024	1.2Two transistor analogy of SCR & 1.3 Gate characteristics of SCR.
	16/07/2024	1.4 Switching characteristic of SCR during Turn on & turn off
	19/07/2024	1.5 Turn on methods of SCR
4th (22/07/2024-27/07/2024)	22/07/2024	1.6 Turn off methods of SCR- load & resonant pulse commutation
	23/07/2024	1.7 voltage & current rating of SCR
	24/07/2024	1.8 Protection of SCR- 1.Over voltage protection 2. Over current protection 3. Gate protection

	26/07/2024	1.9 General layout diagram of firing circuit, R firing circuits, R-C firing circuit
5th (29/07/2024-03/08/2024)	29/07/2024	1.9 UJT pulse trigger circuit Synchronous triggering (Ramp Triggering)
	30/07/2024	1.10 Design of Snubber Circuits
	31/07/2024	**2.Understand the working of converters, AC regulators & choppers** 2.1, 2.2 Working of single-phase half wave controlled converter with Resistive and R-L loads.
	02/08/2024	2.3 & 2.4 Working of single phase fully controlled converter with resistive and R- L loads with and without freewheeling diode
6th (05/08/2024-10/08/2024)	05/08/2024	2.5 Working of three-phase half wave controlled converter with Resistive load
	06/08/2024	2.6 Working of three phase fully controlled converter with resistive load.
	07/08/2024	2.7 Working of dual Converter& single phase AC regulator
	09/08/2024	**Class test 1**
7th (12/08/2024-17/08/2024)	12/08/2024	2.8 Working principle of step up & step down chopper.
	13/08/2024	2.9 Control modes of chopper
	14/08/2024	2.10 Operation of chopper in all four quadrants
	16/08/2024	**3. Understand the inverters & cycloconverters** 3.1 Introduction to inverters. 3.2 working of series inverter
8th(19/08/2024-24/08/2024)	20/08/2024	3.3working of parallel inverter
	21/08/2024	3.4 working of single-phase bridge inverter
	23/08/2024	3.5 Basic principle of Cycloconverter
9th (26/08/2024-31/08/2024)	27/08/2024	3.6 working of single-phase step up & step down Cycloconverter& 3.7 applications of cycloconverter
	28/08/2024	**4. Understand application of power electronic circuits** 4.1, 4.2 Factors affecting the speed of DC Motors
	30/08/2024	4.3 Speed control for DC Shunt motor using converter.
10th (02/09/2024-07/09/2024)	02/09/2024	4.4 Speed control for DC Shunt motor using chopper

	03/09/2024	4.5, 4.6 Speed control of Induction Motor by using AC voltage regulator.
	04/09/2024	4.7 Speed control of induction motor by using converters and inverters (V/F control)
	06/09/2024	4.8 Working of UPS with block diagram.
11th (09/09/2024-14/09/2024)	09/09/2024	4.9 Battery charger circuit using SCR
	10/09/2024	4.10 Basic Switched mode power supply (SMPS)
	11/09/2024	**Internal Assessment**
	13/09/2024	**Internal Assessment**
12th(16/09/2024-21/09/2024)	17/09/2024	**5. PLC & its application** 5.1Introduction of Programmable Logic Controller(PLC)
	18/09/2024	5.3, 5.4 Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.
	20/09/2024	5.2 Advantages of PLC , Applications of PLC
13th (23/09/2024-28/09/2024)	23/09/2024	5.5 , 5.7 Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate
	24/09/2024	5.6 Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output
	25/09/2024	5.6 Description of contacts and coils in the following statesi)latched Output ii) branching
	27/09/2024	5.8 Ladder diagrams for combination circuits using NAND,NOR, AND
14th (30/09/2024-05/10/2024)	30/09/2024	5.8 Ladder diagrams for combination circuits using OR and NOT
	01/10/2024	5.9Timers-i)T ON ii) T OFF Timers-iii)Retentive timer
	04/10/2024	**Quiz test**
15th (14/10/2024-19/10/2024)	14/10/2024	5.10 Counters-CTU, CTD
	15/10/2024	**Class test 2**
	18/10/2024	5.11 Ladder diagrams using Timers and counters

16th (21/10/2024-26/10/2024)	21/10/2024	5.12, 5.13 PLC instruction set , Ladder diagrams- DOL starter
	22/10/2024	5.13Ladder diagrams- DOL starter
	23/10/2024	5.13 Ladder diagrams- STAR-DELTA starter
	25/10/2024	5.13 Ladder diagrams- Stair case lighting,
17th (28/10/2024-02/11/2024)	28/10/2024	5.13 Ladder diagrams- Traffic light Control
	29/10/2024	5.13Ladder diagrams- Temperature Controller
	30/10/2024	5.14Basics DCS & SCADA systems
18th (04/11/2024-08/11/2024)	04/11/2024	5.15 Computer Control–Data Acquisition
	05/11/2024	5.15 Direct Digital Control System
	06/11/2024	**REVISION**
	08/11/2024	**DISCUSSION OF PREVIOUS YEAR QUESTIONS**