



GOVERNMENT POLYTECHNIC, BALASORE

Government of Odisha

ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ, ବାଲେଶ୍ଵର

ACADEMIC LESSON PLAN FOR WINTER SEMESTER - 2023

DEPT. OF ELECTRONICS & TELECOMMUNICATION, GOVT. POLYTECHNIC, BALASORE

NAME OF THE FACULTY: DEBASISH MOHAPATRA (PTGF)

TH.3: DIGITAL ELECTRONICS & MICROPROCESSOR

Subject Number: TH.3

Theory/Practical: 5 P/W

Total Periods: 75 P/ Sem

Examination: 3 Hours

Sem. & Branch : 5TH & Elect. Engg.

Internal Assessment : 20 Marks

End Semester Exams : 80Marks

Total Marks : 100 Marks

Class Starts : 01/08/2023

Discipline :- ELECTRICAL	Semester:- 5th	Name of the Teaching Faculty: - DEBASISH MOHAPATRA
Subject:- DIGITAL ELECTRONICS& MICROPROCESSOR (TH-3)	No of Days/per Week Class Allotted : 05	Semester From:- 1st August, 2023 To:- 30st November, 2023
Week	Class Day	Theory
1st	1st	Introduction To Digital Electronics
	2nd	Number Systems And Codes
	3rd	List different number system & their relevance: binary, octal, decimal, Hexadecimal, Study the Conversion from one number system to another
	4th	Perform Arithmetic operations of binary number systems.
	5th	1's & 2's complement of Binary numbers., Perform Subtraction of binary numbers using complementary numbers. Perform multiplication and division of binary numbers.
2nd	1st	Define concept of Digital Code & its application. Distinguish between weighted & non-weight Code
	2nd	Study Codes: definition, relevance
	3rd	Types of code (8-4-2-1, Gray, Excess-3 and importance of parity bit.
	4th	LOGIC GATES Discuss the Basic Logic & representation using electric signals
	5th	Learn the Basic Logic gates (NOT, OR, AND, NOR, NAND, EX-OR & EXNOR) – Symbol, function, expression, truth table & example IC nos.
3rd	1st	Define Universal Gates with examples & realization of other gates
	2nd	Universal Gates with examples & realization of other gates
	3rd	BOOLEAN ALGEBRA Understand Boolean : constants, variables & functions. Comprehend the Laws of Boolean algebra
	4th	Understand Boolean : constants, variables & functions. Comprehend the Laws of Boolean algebra
	5th	State and prove Demorgan's Theorems. Represent Logic Expression : SOP & POS forms & conversion
4th	1st	Simplify the Logic Expression/Functions (Maximum of 4 variables) : using Boolean algebra and Karnaugh's map methods
	2nd	What is don't care conditions ? Realisation of simplified logic expression

		using K-Map
	3 rd	Realisation of simplified logic expression using gates. Illustrate with examples the above.
	4 th	COMBINATIONAL CIRCUITS Define a Combinational Circuit and explain with examples. Arithmetic Circuits (Binary)
	5 th	Realise function, functional expression, logic circuit, gate level circuit, truth table & applications of Half-adders,
5 th	1 st	
	2 nd	Full-adder & full-Subtractor. Explain Serial & Parallel address: concept comparison & application
	3 rd	Discuss Multiplexers: definition, relevance, gate level circuit of simple. De-multiplexers (1:4) logic circuit with truth Table
	4 th	Explain the working of Binary-Decimal Encoder & Decoder.
	5 th	Discuss Multiplexers: definition, relevance, gate level circuit of simple. De-multiplexers (1:4) logic circuit with truth Table
6 th	1 st	Explain the working of Binary-Decimal Encoder & Decoder.
	2 nd	Working of 2-bit Magnitude Comparator: logic expression, truth table
	3 rd	Working of 2-bit Magnitude Comparator: logic expression, truth table
	4 th	Working of 2-bit Magnitude Comparator: logic expression, truth table
	5 th	Define Sequential Circuit : Explain with examples.
7 th	1 st	Know the Clock-definition characteristics, types of triggering & waveform.
	2 nd	Know the Clock-definition characteristics, types of triggering & waveform.
	3 rd	Define Flip-Flop, Study RS, Clocked RS, D, T, JK, MS-JK flip-flop with logic Circuit and truth tables.
	4 th	Define Flip-Flop, Study RS, Clocked RS, D, T, JK, MS-JK flip-flop with logic Circuit and truth tables.
	5 th	Define Flip-Flop, Study RS, Clocked RS, D, T, JK, MS-JK flip-flop with logic Circuit and truth tables.
8 th	1 st	Concept of Racing and how it can be avoided.
	2 nd	Applications of flip-flops & its conversion.
	3 rd	List the different types of counters-Synchronous and Asynchronous.
	4 th	Explain the modulus of a counter
	5 th	List the different types of counters-Synchronous and Asynchronous.
9 th	1 st	Explain the modulus of a counter
	2 nd	List the different types of counters-Synchronous and Asynchronous. Explain the modulus of a counter 4-bit asynchronous counter with timing diagram
	3 rd	Asynchronous decade counter
	4 th	List the different types of counters-Synchronous and Asynchronous. Explain the modulus of a counter 4-bit asynchronous counter with timing diagram
	5 th	Asynchronous decade counter
10 th	1 st	List the different types of counters-Synchronous and Asynchronous. Explain the modulus of a counter 4-bit asynchronous counter with timing diagram
	2 nd	Asynchronous decade counter

	3 rd	4-bit synchronous counter
	4 th	Compare Synchronous and Asynchronous counters and know their ICs nos.
	5 th	Tutorial
11 th	1 st	Explain the working of various types of shift registers – SISO
	2 nd	SIPO
	3 rd	PISO
	4 th	PIPO, with truth table using flip flop.
	5 th	8085 MICRO PROCESSOR
12 th	1 st	Introduction to microprocessor, Micro computers
	2 nd	Architecture of intel 8085A Microprocessor
	3 rd	, Functional Block diagram and Description of each block.
	4 th	Pin diagram and description.
	5 th	Stack, Stack Pointer, Stack Top
13 th	1 st	Interrupts , Op-code & Operands
	2 nd	Grouping and Explanation of different group instructions with examples
	3 rd	Instruction sets & Addressing modes
	4 th	Instruction sets & Addressing modes
	5 th	Instruction fetching and execution, Timing diagram of different machine cycle.
14 th	1 st	Instruction fetching and execution, Timing diagram of different machine cycle.
	2 nd	Instruction fetching and execution, Timing diagram of different machine cycle.
	3 rd	Timing diagram of different machine cycle, 8085A timing states.
	4 th	Timing diagram of different machine cycle, 8085A timing states.
	5 th	Basic Interfacing Concept , Memory Mapping & I/O Mapping
15 th	1 st	Programmable peripheral interface Intel -8255, Functional block diagram and Operation of 8255,
	2 nd	Programming of 8255
	3 rd	Application Using 8255: Seven Segment LED display
	4 th	Square Wave Generator
	5 th	Traffic light controller

Teaching Faculty

HOD, ELE

Academic Co-coordinator

Principal

G. P. Balasore



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ACADEMIC LESSON PLAN FOR WINTER SEMESTER OCTOBER - 2023

DEPT. OF ELECTRONICS & TELECOMMUNICATION, GOVT. POLYTECHNIC, BALASORE

NAME OF THE FACULTY: DEBASISH MOHAPATRA (PTGF)

Pr.3: DIGITAL ELECTRONICS & MICROPROCESSOR LAB

Subject Number: TH.3
 Theory/Practical: 3 P/W
 Total Periods: 45 P/ Sem
 Examination: 3 Hours
 Sem. & Branch : 5TH, EE Engg.

Term work : 25 Marks
 End Semester Exams : 50Marks
 Total Marks : 75 Marks
 Class Starts : 01/08/2023

Discipline :- ELECTRICAENGG	Semester:- 5th	Name of the Teaching Faculty: - DEBASISH MOHAPATRA(PTGF)
Subject:- DIGITAL ELECTRONICS& MICROPROCESSOR LAB/Pr-3	No of Days/per Week Class Allotted :- 01	Semester From:- 1st August, 2023 To:- 30st November, 2023
Week	Class Day	LABORATORY
1 st	1 st	Verify truth tables of AND, OR, NOT, NOR, NAND, XOR, XNOR gates. Implement various gates by using universal properties of NAND & NOR gates and verify truth table.
2 nd	2 nd	Implement half adder and Full adder using logic gates. Implement half subtractor and Full subtractor using logic gates.
3 rd	3 rd	Implement a 4-bit Binary to Gray code converter. Implement a Single bit digital comparator.
4 th	4 th	Study Multiplexer and de-multiplexer
5 th	5 th	Study of flip-flops. i) S-R flip flop ii) J-K flip flop iii) flip flop iv) T flip flop
6 th	6 th	Realize a 4-bit asynchronous UP/Down counter with a control for up/down counting..
7 th	7 th	Realize a 4-bit synchronous UP/Down counter with a control for up/down counting.
8 th	8 th	Implement Mode-10 asynchronous counters
9 th	9 th	Study shift registers.

10 th	10 th	General Programming using 8085A development board 1'S Complement, 2'S Complement
11 th	11 th	Addition of 8-bit number Subtraction of 8-bit number
12 th	12 th	Decimal Addition 8-bit number DecimalSubtraction 8-bit number.
13 th	13 th	Compare between two numbers Find the largest in an Array, Block Transfer
14 th	14 th	Traffic light control using 8255
15 th	15 th	Generation of square wave using 8255

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