GOVERNMENT POLYTECHNIC KORAPUT
DEPARTMENT OF ELECTRICAL ENGINEERING

TH.3 DIGITAL ELECTRONICS & MICROPROCESSOR

Name of the Course: Diploma in Electrical Engineering			
Faculty: S Bichiballi		**WEF: 01/08/2023**	
Course code:	Th.3	**Semester:**	5th
Total Period:	75 Periods	**Examination:**	3 Hrs
Theory periods:	5P / Week	**Internal Assessment:**	20
Tutorial:	-	**End Semester Examination:**	80
Maximum marks:	100		

VISION:

To create competent & industry ready Electrical Diploma Engineers with professional and social values to meet future challenges.

MISSION:

- To prepare diploma holders through "qualitative competency based education system" to compete with national requirement along with core values.
- To produce dynamic Electrical Engineers to serve the society and industry.
- To develop leadership qualities, communication skills, critical thinking and attitude for lifelong learning.

PROGRAM EDUCATIONAL OBJECTIVES:

PEO1	Apply technical knowledge and skills learned in the field of Electrical Engineering to excel in Professional and or higher education.
PEO2	To provide students an excellent academic environment and make them aware the needs of Society and Industry to become a successful Professional/Entrepreneur.
PEO3	To engage in lifelong learning, career enhancement to adopt emerging technologies

COURSE OUTCOMES:

CO1	Outline Number system, Boolean algebra, codes, understand logic gates and verify truth tables.
CO2	Design various combinational and sequential circuits using logic gates.
CO3	Understand 8085 Microprocessor and write simple assembly language program.
CO4	Design control logic gates using 8085 Microprocessor and 8255 interface.

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TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	Periods
1.	Basics Of Digital Electronics	15
2.	Combinational Logic Circuits	15
3.	Sequential Logic Circuits	15
4.	8085 Microprocessor	20
5.	Interfacing And Support Chips	10
Total		**75**

LESSON PLAN

Week	Day	Theory topic
1st	1st	**Basics of Digital Electronics:** Binary number systems and compare with Decimal system.
	2nd	Octal, Hexadecimal number systems and compare with Decimal system.
	3rd	Binary Addition, Subtraction, Multiplication and Division.
	4th	1's complement and 2's complement numbers for a binary number
	5th	Subtraction of binary numbers in 2's complement method.
2nd	1st	Use of weighted and Un-weighted codes & write Binary equivalent numberfor a number in 8421, Excess-3 and Gray Code and vice versa.
	2nd	Use of weighted and Un-weighted codes & write Binary equivalent numberfor a number in 8421, Excess-3 and Gray Code and vice versa.
	3rd	Importance of parity Bit.
	4th	Logic Gates: AND, OR, NOT, NAND, NOR and EX-OR gates with truth table.
	5th	Realize AND, OR, NOT operations using NAND, NOR gates.
3rd	1st	Different postulates and De-Morgan's theorems in Boolean algebra.
	2nd	Use Of Boolean Algebra For Simplification Of Logic Expression
	3rd	Karnaugh Map For 2,3,4 Variable, Simplification Of SOP And POS Logic ExpressionUsing K-Map.
	4th	Karnaugh Map For 2,3,4 Variable, Simplification Of SOP And POS Logic ExpressionUsing K-Map.
	5th	Karnaugh Map For 2,3,4 Variable, Simplification Of SOP And POS Logic ExpressionUsing K-Map.
4th	1st	**Combinational logic circuits:** Give the concept of combinational logic circuits.
	2nd	Half adder circuit and verify its functionality using truth table.
	3rd	Realize a Half-adder using NAND gates only and NOR gates only.
	4th	Full adder circuit and explain its operation with truth table.
	5th	Realize full-adder using two Half-adders and an OR gate and write truth table.
5th	1st	Full Subtractor circuit and explain its operation with truth table.
	2nd	Operation of 4 X 1 Multiplexers and 1 X 4 Demultiplexer.

	3rd	Operation of 4 X 1 Multiplexers and 1 X 4 Demultiplexer.
	4th	Working of Binary-Decimal Encoder & 3 X 8 Decoder.
	5th	Working of Binary-Decimal Encoder & 3 X 8 Decoder.
6th	1st	Working of Two bit magnitude comparator.
	2nd	Working of Two bit magnitude comparator.
	3rd	Previous year questions.
	4th	Previous year questions.
	5th	Previous year questions.
7th	1st	**8085 Microprocessor:** Introduction to Microprocessors, Microcomputers.
	2nd	Architecture of Intel 8085A Microprocessor and description of each block.
	3rd	Architecture of Intel 8085A Microprocessor and description of each block.
	4th	Pin diagram and description.
	5th	Stack, Stack pointer & stack top.
8th	1st	Interrupts.
	2nd	Opcode & Operand.
	3rd	Differentiate between one byte, two byte & three byte instruction with example.
	4th	Instruction set of 8085 example.
	5th	Instruction set of 8085 example.
9th	1st	Addressing modes.
	2nd	Fetch Cycle, Machine Cycle, Instruction Cycle, T-State.
	3rd	Timing Diagram for memory read, memory write, I/O read, I/O write.
	4th	Timing Diagram for 8085 instruction.
	5th	Counter and time delay.
10th	1st	Simple assembly language programming of 8085.
	2nd	Simple assembly language programming of 8085.
	3rd	Simple assembly language programming of 8085.
	4th	Simple assembly language programming of 8085.
	5th	Previous year question discussion.
11th	1st	**Sequential logic circuits:** Give the idea of Sequential logic circuits.
	2nd	State the necessity of clock and give the concept of level clocking and edge triggering,
	3rd	Clocked SR flip flop with preset and clear inputs.
	4th	Construct level clocked JK flip flop using S-R flip-flop and explain with truth table
	5th	Concept of race around condition and study of master slave JK flip flop.
12th	1st	Give the truth tables of edge triggered D and T flip flops and draw their symbols.
	2nd	Applications of flip flops.
	3rd	Define modulus of a counter
	4th	4-bit asynchronous counter and its timing diagram.
	5th	Asynchronous decade counter.
13th	1st	4-bit synchronous counter.
	2nd	Distinguish between synchronous and asynchronous counters.
	3rd	State the need for a Register and list the four types of registers.
	4th	Working of SISO, SIPO, PISO, PIPO Register with truth table using flip flop.
	5th	Working of SISO, SIPO, PISO, PIPO Register with truth table using flip flop.
14th	1st	**Interfacing and Support chips:**
	2nd	Basic Interfacing Concepts.

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	3rd	Memory mapping & I/O mapping.
	4th	Functional block diagram and description of each block of Programmable peripheral interface Intel 8255.
	5th	Functional block diagram and description of each block of Programmable peripheral interface Intel 8255.
15th	1st	Application using 8255: Seven segment LED display.
	2nd	Square wave generator.
	3rd	Traffic lightController.
	4th	Revision.
	5th	Previous year question discussion.

01/08/2023

Signature of faculty concerned

H.O.D. Electrical