ACADEMIC SESSION : 2025-26

Discipline : Electrical Engineering	Semester : 5TH	Name and Designation of the Teaching Faculty : Sri Shailesh Kumar Nayak, Lecturer Stage-II (ETC)
Subject : Digital Electronics & Microprocessor	Nos. of days / week class allotted: 05	Semester wef : 14.07.2025 to 15.11.2025 Nos. of Weeks per Semester : 15
Week	**Class Day**	**Theory/ Practical Topics**
1ST	1st	Basics of Digital Electronics Binary, Octal, Hexadecimal number systems and compare with Decimal system.
	2nd	Binary, Octal, Hexadecimal number systems and compare with Decimal system.
	3rd	Binary addition, subtraction, Multiplication and Division.
	4th	Binary addition, subtraction, Multiplication and Division.
	5th	1's complement and 2's complement numbers for a binary number
2ND	1st	Subtraction of binary numbers in 2's complement method.
	2nd	Use of weighted and Un-weighted codes & write Binary equivalent number for a number in 8421, Excess-3 and Gray Code and vice-versa.
	3rd	Use of weighted and Un-weighted codes & write Binary equivalent number for a number in 8421, Excess-3 and Gray Code and vice-versa.
	4th	Importance of parity Bit.
	5th	Logic Gates: AND, OR, NOT, NAND, NOR and EX-OR gates with truth table.
3RD	1st	Realize AND, OR, NOT operations using NAND, NOR gates.
	2nd	Different postulates and De-Morgan's theorems in Boolean algebra.
	3rd	Use of Boolean Algebra for Simplification of Logic Expression
	4th	Karnaugh Map For 2,3,4 Variable, Simplification of SOP And POS Logic Expression Using K-Map
	5th	Karnaugh Map For 2,3,4 Variable, Simplification of SOP And POS Logic Expression Using K-Map
4TH	1st	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	Realize a Half-adder using NAND gates only and NOR gates only.
	5th	Full adder circuit and explain its operation with truth table.
5TH	1st	Realize full-adder using two Half-adders and an OR – gate and write truth table
	2nd	Realize full-adder using two Half-adders and an OR – gate and write truth table
	3rd	Full subtractor circuit and explain its operation with truth table.
	4th	Full subtractor circuit and explain its operation with truth table.
	5th	Operation of 4 X 1 Multiplexers and 1 X 4 demultiplexer
6TH	1st	Operation of 4 X 1 Multiplexers and 1 X 4 demultiplexer
	2nd	Working of Binary-Decimal Encoder & 3 X 8 Decoder.
	3rd	Working of Binary-Decimal Encoder & 3 X 8 Decoder.
	4th	Working of Two bit magnitude comparator
	5th	Working of Two bit magnitude comparator
7TH	1st	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.

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8TH	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.
9TH	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.
10TH	1st	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	Pin diagram and description.
11TH	1st	Stack, Stack pointer & stack top,
	2nd	Interrupts
	3rd	Opcode & Operand,
	4th	Differentiate between one byte, two byte & three byte instruction with example.
	5th	Instruction set of 8085 example
12TH	1st	Instruction set of 8085 example
	2nd	Addressing mode
	3rd	Fetch Cycle, Machine Cycle, Instruction Cycle, T-State
	4th	Timing Diagram for memory read, memory write, I/O read, I/O write
	5th	Timing Diagram for 8085 instruction
13TH	1st	Timing Diagram for 8085 instruction
	2nd	Counter and time delay.
	3rd	Simple assembly language programming of 8085
	4th	Simple assembly language programming of 8085
	5th	Simple assembly language programming of 8085
14TH	1st	Basic Interfacing Concepts
	2nd	Memory mapping & I/O mapping
	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	Functional block diagram and description of each block of Programmable peripheral interface Intel 8255,
	2nd	Application using 8255: Seven segment LED display, Square wave generator, Traffic light Controller
	3rd	Application using 8255: Seven segment LED display, Square wave generator, Traffic light Controller
	4th	Application using 8255: Seven segment LED display, Square wave generator, Traffic light Controller
	5th	Review and Previous Year Question Discussion

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