| Discipline : CSE | Semester:- 3rd | Name of the Teaching Faculty: - Jashaswini Satapathy |
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| Subject:- DIGITAL ELECTRONICS (TH-3) | No of Days/per Week Class Allotted :- 04 | Semester From:- 01.07.2024 |
| Week | Class Day | Theory |
| 1st | 1st | Introduction to DIGITAL ELECTRONICS<br>NUMBER SYSTEMS AND CODES |
| | 2nd | List different number system & their relevance: binary, octal, decimal, Hexadecimal, Study the Conversion from one number system to another |
| | 3rd | Perform Arithmetic operations of binary number systems. |
| | 4th | 1's & 2's complement of Binary numbers.,<br>Perform Subtraction of binary numbers using complementary numbers.<br>Perform multiplication and division of binary numbers. |
| 2nd | 1st | Define concept of Digital Code & its application.<br>Distinguish between weighted & non-weight Code |
| | 2nd | Study Codes: definition, relevance Types of code (8-4-2-1, Gray, Excess-3 and importance of parity bit |
| | 3rd | LOGIC GATES<br>Discuss the Basic Logic & representation using electric signals. Learn the Basic Logic gates (NOT, OR, AND, NOR, NAND, EX-OR & EXNOR) – Symbol, function, expression, truth table & example IC nos., Define Universal Gates with examples & realization of other gates |
| | 4th | BOOLEAN ALGEBRA<br>Understand Boolean : constants, variables & functions.<br>Comprehend the Laws of Boolean algebra |
| 3rd | 1st | State and prove Demorgan's Theorems.<br>Represent Logic Expression : SOP & POS forms & conversion |
| | 2nd | Simplify the Logic Expression/Functions (Maximum of 4 variables) : using Boolean algebra and Karnaugh's map methods |
| | 3rd | What is don't care conditions ?Realisation of simplified logic expression using K-Map |
| | 4th | Realisation of simplified logic expression using gates.<br>Illustrate with examples the above. |
| 4th | 1st | COMBINATIONAL CIRCUITS |
| | 2nd | Define a Combinational Circuit and explain with examples.<br>Arithmetic Circuits (Binary) |
| | 3rd | Realise function, functional expression, logic circuit, gate level circuit, truth table & applications of Half-adders, |
| | 4th | Half-adder & Half-Subtractor.<br>Explain Serial & Parallel address: concept comparison & application |
| 5th | 1st | Full-adder & full-Subtractor.<br>Explain Serial & Parallel address: concept comparison & application |
| | 2nd | Discuss Multiplexers(4:1): definition, relevance, gate level circuit of simple. |
| | 3rd | Discuss De-multiplexers (1:4) logic circuit with truth Table |
| | 4th | Explain the working of Binary-Decimal Encoder & Decoder |

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| 6th | 1st | Explain the working of Digital comparator (3 Bit) |
| | 2nd | Explain the working of Seven segment Decoder |
| | 3rd | Applications of Half-adder & Half-Subtractor, Full-adder & full-Subtractor, Multiplexers(4:1), De-multiplexers (1:4) |
| | 4th | Applications of Encoder & Decoder, Digital comparator (3 Bit), Seven segment Decoder |
| 7th | 1st | SEQUENTIAL LOGIC CIRCUITS |
| | 2nd | Define Sequential Circuit : Explain with examples. |
| | 3rd | Principle of flip-flops operation, its Types |
| | 4th | Know the Clock-definition characteristics, types of triggering & waveform. |
| 8th | 1st | Define Flip-Flop |
| | 2nd | SR Flip Flop using NAND,NOR Latch (un clocked) |
| | 3rd | SR Flip Flop using NAND,NOR Latch (un clocked) |
| | 4th | SR Flip Flop using NAND,NOR Latch (un clocked) |
| 9th | 1st | Clocked SR,D,JK,T,JK Master Slave flip-flops-Symbol, logic Circuit, truth table and applications |
| | 2nd | Clocked SR,D,JK,T,JK Master Slave flip-flops-Symbol, logic Circuit, truth table and applications |
| | 3rd | Clocked SR,D,JK,T,JK Master Slave flip-flops-Symbol, logic Circuit, truth table and applications |
| | 4th | Clocked SR,D,JK,T,JK Master Slave flip-flops-Symbol, logic Circuit, truth table and applications |
| 10TH | 1st | Concept of Racing and how it can be avoided. |
| | 2nd | Registers, Memories & PLD |
| | 3rd | Shift Registers-Serial in Serial -out, Serial- in Parallel-out, Parallel in serial out and Parallel in parallel out |
| | 4th | Shift Registers-Serial in Serial -out, Serial- in Parallel-out, Parallel in serial out and Parallel in parallel out |
| 11th | 1st | Universal shift registers-Applications. |
| | 2nd | Types of Counter & applications |
| | 3rd | Types of Counter & applications |
| | 4th | Binary counter, Asynchronous ripple counter (UP & DOWN), Decade counter |
| 12th | 1st | Binary counter, Asynchronous ripple counter (UP & DOWN), Decade counter |
| | 2nd | Binary counter, Asynchronous ripple counter (UP & DOWN), Decade counter |
| | 3rd | |
| | 4th | Synchronous counter, Ring Counter |
| 13th | 1st | Synchronous counter, Ring Counter |
| | 2nd | Concept of memories-RAM, ROM, static RAM, dynamic RAM,PS RAM |

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| | 3rd | Concept of memories-RAM, ROM, static RAM, dynamic RAM,PS RAM |
| | 4th | Basic concept of PLD & applications |
| 14th | 1st | A/D and D/A Converters |
| | 2nd | Necessity of A/D and D/A converters |
| | 3rd | D/A conversion using weighted resistors methods. |
| | 4th | D/A conversion using R-2R ladder (Weighted resistors)network |
| 15th | 1st | D/A conversion using R-2R ladder (Weighted resistors)network |
| | 2nd | A/D conversion using counter method. |
| | 3rd | A/D conversion using Successive approximate method |
| | 4th | LOGIC FAMILIES |
| 16th | 1st | Various logic families &categories according to the IC fabrication process |
| | 2nd | Various logic families &categories according to the IC fabrication process |
| | 3rd | Characteristics of Digital ICs- Propagation Delay, fan-out, fan-in |
| | 4th | Characteristics of Digital ICs-<br>Power Dissipation ,Noise Margin , |
| 17th | 1st | Power Supply requirement &Speed with Reference to logic families. |
| | 2nd | Features of TTL(NAND), CMOS (NAND & NOR) |
| | 3rd | circuit operation of TTL(NAND), CMOS (NAND & NOR) |
| | 4th | applications of TTL(NAND), CMOS (NAND & NOR) |

Teaching Faculty

HOD , ETC