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| Discipline :-  **ELECTRICAL** | Semester:-  **5th** | Name of the Teaching Faculty: -  **SIDDHARTH SETHI** |
| Subject:-  **DIGITAL ELECTRONICS&**  **MICROPROCESSOR**  **(TH-3)** | No of Days/per Week Class Allotted :-  **05** | Semester From:- **01stSeptember,2020** To:- **20thFebruary,2021** |
| **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** |
| 5th | Discuss the Basic Logic & representation using electric signals |
| 3rd | 1st | Learn the Basic Logic gates (NOT, OR, AND, NOR, NAND, EX-OR & EXNOR) – Symbol, function, expression, truth table & example IC nos. |
| 2nd | Define Universal Gates with examples & realization of other gates |
| 3rd | **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 |
| 3rd | Realisation of simplified logic expression using gates.  Illustrate with examples the above. |
| 4th | **COMBINATIONAL CIRCUITS** |
| 5th | Define a Combinational Circuit and explain with examples.  Arithmetic Circuits (Binary) |
| 5th | 1st | Realise function, functional expression, logic circuit, gate level circuit, truth table & applications of Half-adders, |
| 2nd | Full-adder & full-Subtractor.  Explain Serial & Parallel address: concept comparison & application |
| 3rd | Discuss Multiplexers: definition, relevance, gate level circuit of simple. De-multiplexers (1:4) logic circuit with truth Table |
| 4th | Explain the working of Binary-Decimal Encoder & Decoder. |
| 5th | Working of 2-bit Magnitude Comparator: logic expression, truth table |
| 6th | 1st | **SEQUENTIAL CIRCUITS** |
| 2nd | Define Sequential Circuit : Explain with examples. |
| 3rd | Know the Clock-definition characteristics, types of triggering & waveform. |
| 4th | Define Flip-Flop, Study RS, Clocked RS, D, T, JK, MS-JK flip-flop with logic Circuit and truth tables. |
| 5th | Concept of Racing and how it can be avoided. |
| 7th | 1st | Applications of flip-flops & its conversion. |
| 2nd | **COUNTERS** |
| 3rd | List the different types of counters-Synchronous and Asynchronous. |
| 4th | Explain the modulus of a counter |
| 5th | **COUNTERS** |
| 8th | 1st | List the different types of counters-Synchronous and Asynchronous.  Explain the modulus of a counter  4-bit asynchronous counter with timing diagram |
| 2nd | Asynchronous decade counter |
| 3rd | 4-bit synchronous counter |
| 4th | Compare Synchronous and Asynchronous counters and know their ICs nos. |
| 5th | **REGISTERS** |
| 9th | 1st | Explain the working of various types of shift registers – SISO |
| 2nd | SIPO |
| 3rd | PISO |
| 4th | PIPO, with truth table using flip flop. |
| 5th | **8085 MICRO PROCESSOR** |
| 10th | 1st | Introduction to microprocessor, Micro computers |
| 2nd | Architecture of intel 8085A Microprocessor |
| 3rd | , Functional Block diagram and Description of each block. |
| 4th | Pin diagram and description. |
| 5th | Stack, Stack Pointer, Stack Top |
| 11th | 1st | Interrupts , Op-code & Operands |
| 2nd | Grouping and Explanation of different group instructions with examples |
| 3rd | Instruction sets &Addressing modes |
| 4th | Instruction fetching and execution, Timing diagram of different machine cycle. |
| 5th | Timing diagram of different machine cycle, 8085A timing states. |
| 12th | 1st | Basic Interfacing Concept , Memory Mapping & I/O Mapping |
| 2nd | Programmable peripheral interface Intel -8255, Functional block diagram and Operation of 8255, Programming of 8255 |
| 3rd | Application Using 8255: Seven Segment LED display |
| 4th | Square Wave Generator |
| 5th | Traffic light controller |
| 13th | 1st | Doubt Clearing Classes and Revision of Syllabus |
| 2nd |
| 3rd |
| 4th |
| 5th |
| 14th | 1st | Previous Five (05) Years Semester Question Answer Discussion |
| 2nd |
| 3rd |
| 4th |
| 5th |

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| Discipline :-  **ELECTRICAL** | Semester:-  **5th** | Name of the Teaching Faculty: -  **LINCOLN MOHANTY** |
| Subject:-  **DIGITAL ELECTRONICS&**  **MICROPROCESSOR LAB** | No of Days/per Week Class Allotted :-  **01** | Semester From:- **01stSeptember,2020** To:- **20thFebruary, 2021** |
| **Week** | **Class Day** | **LABORATORY** |
| 1st | 1st | 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. |
| 2nd | 2nd | Implement half adder and Full adder using logic gates.  Implement half subtractor and Full subtractor using logic gates. |
| 3rd | 3rd | Implement a 4-bit Binary to Gray code converter. Implement a Single bit digital comparator. |
| 4th | 4th | Study Multiplexer and de-multiplexer |
| 5th | 5th | Study of flip-flops. i) S-R flip flop ii) J-K flip flop iii) flip flop iv) T flip flop |
| 6th | 6th | Realize a 4-bit asynchronous UP/Down counter with a control for up/down counting.. |
| 7th | 7th | Realize a 4-bit synchronous UP/Down counter with a control for up/down counting. |
| 8th | 8th | Implement Mode-10 asynchronous counters |
| 9th | 9th | Study shift registers. |
| 10th | 10th | **General Programming using 8085A development board**  1’S Complement, 2’S Complement |
| 11th | 11th | Addition of 8-bit number  Subtraction of 8-bit number |
| 12th | 12th | Decimal Addition 8-bit number  DecimalSubtraction 8-bit number. |
| 13th | 13th | Compare between two numbers  Find the largest in an Array, Block Transfer |
| 14th | 14th | Traffic light control using 8255, Generation of square wave using 8255 |

**Teaching Faculty HOD , ELE Academic Co-ordinator**

**Principal**

**Government Polytechnic, Puri**