**VIGNAN’S INSTITUTE OF INFORMATION TECHNOLOGY (A)**

**­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­Question Bank Mid-I Portion**

**(2023 Batch) II B. Tech- II Semester**

Name of the Subject: DLCO Subject Code:1005232101

Branch: CSE

Name of the Faculty: Dr. P.V.S. Charishma Designation: Associate Professor

Email: [saicharishma417@gmail.com](mailto:saicharishma417@gmail.com) Phone No: 7989738978

**UNIT-1 PART-A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No** | **Short Answer Questions** | **Level of Bloom Taxonomy** | **CO** | **Marks**  **(2M)** |
| 1 | Convert the decimal number 45 to binary? | L2 | CO1 | 2M |
| 2 | Mention the fixed-point representation (-7.5)10 with 4 bits for the integer part and 4 bits for the fractional part, | L2 | CO1 | 2M |
| 3 | Convert the binary number 110101.101to decimal | L3 | CO1 | 2M |
| 4 | Convert the octal number 157 to binary and then to decimal. | L2 | CO1 | 2M |
| 5 | Convert hexadecimal representation of the decimal number 255? | L2 | CO1 | 2M |
| 6 | Represent I’s complement of 6? | L2 | CO1 | 2M |
| 7 | What is the primary function of a decoder in digital circuits? | L1 | CO1 | 2M |
| 8 | Why is minimizing logic expressions important in digital circuit design? | L2 | CO1 | 2M |
| 9 | How many selection lines are needed for a multiplexer with 8 input lines and draw the corresponding diagram? | L2 | CO1 | 2M |
| 10 | What are the universal gates, why are they called so? | L3 | CO1 | 2M |

**UNIT-1 PART-B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No** | | **Descriptive Questions** | **Level of Bloom Taxonomy** | **CO** | **Marks**  **(10M)** |
| 1 |  | Simplify the function using K-Map  f (A, B, C) = ∑m (0,2,4,5,6)  Give its truth table and realize the simplified expression using basic gates. | L3 | CO1 | 10M |
| 2 |  | Simply the function using K-map    Realize the simplified expression using basic gates. | L2 | CO1 | 10M |
| 3 |  | What is a decoder, and how does it function? Describe the operation of a 3-to-8 decoder, including its truth table and output for specific input combinations. | L3 | CO1 | 10M |
| 4 |  | Explain the role of a multiplexer in digital systems. How does an 8-to-1 multiplexer operate, and what is the significance of its selection lines? Provide a truth table for clarity. | L3 | CO1 | 10M |
| 5 | a | Simplify the given problem?  (X+Y) (X+Y’)  A’C’+ABC+AC’ | L3 | CO1 | 5M |
| b | Simplify the Boolean function using K-map  F (A, B, C, D) =∑m= (0,1,2,35,7,8,9,10,12,13). | L3 | CO1 | 5M |
| 6 | a | Find the SOP and POS of the given expression?  (XY+Z) (XZ+Y) | L2 | CO1 | 5M |
| b | Solve F (A, B, C, D) = ∑m (5,6,7,12,13) + ∑d (4,9,14,15) | L2 | CO1 | 5M |
| 7 | a | Convert the Following into required Numbering System  [10011001]2 = [ ]8  [A7BD]16 = []10  [83.39]10 = []16 | L2 | CO1 | 5M |
| b | Perform the binary addition of -14 and +6 with 1’s and 2’s compliment method | L2 | CO1 | 5M |
| 8 | a | Demonstrate the representations of negative numbers along with examples | L2 | CO1 | 5M |
| b | Realization of basic gates using NAND Gate. | L3 | CO1 | 5M |
| 9 | a | Design 16X1 MUX using 8X1 MUX and explain its truth table | L3 | CO1 | 5M |
| b | Describe Gray code and its significance. How does Gray code differ from standard binary code? | L3 | CO1 | 5M |
| 10 | a | Convert the binary number 110111011101 to GRAY code and Excess-3 Code | L3 | CO1 | 5M |
| b | Convert the binary number 110111011101 to Octal and Hexadecimal numbers. | L2 | CO1 | 5M |

**UNIT-2 PART-A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No** | **Short Answer Questions** | **Level of Bloom Taxonomy** | **CO** | **Marks**  **(2M)** |
| 1 | What is a flip-flop, and how does it function as a basic building block for memory elements in digital systems? | L2 | CO1 | 2M |
| 2 | What are registers in digital electronics, and how do they facilitate data storage and transfer within a CPU? | L2 | CO1 | 2M |
| 3 | What are the key differences between synchronous and asynchronous binary counters? | L3 | CO1 | 2M |
| 4 | How do sequential circuits differ from combinational circuits? | L2 | CO1 | 2M |
| 5 | What is a ripple counter? | L2 | CO1 | 2M |
| 6 | What are the different kind of shift registers? | L2 | CO1 | 2M |
| 7 | Draw the SR latch and its Truth table. | L1 | CO1 | 2M |
| 8 | How to overcome Racing condition in JK Flipflop? | L2 | CO1 | 2M |
| 9 | Draw the JK flipflop circuit diagram. | L2 | CO1 | 2M |
| 10 | Compare Latch and Flipflop. | L3 | CO1 | 2M |

**UNIT-2 PART-B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No** | | **Descriptive Questions** | **Level of Bloom Taxonomy** | **CO** | **Marks**  **(10M)** |
| 1 | a | What are sequential circuits, and how do they differ from combinational circuits in terms of memory and state? | L3 | CO1 | 10M |
| 2 | a | Describe the operation of a 3-bit asynchronous counter with necessary diagrams. | L2 | CO1 | 10M |
| 3 | a | Describe the operation of a 4 bit ripple counter with necessary diagrams. | L3 | CO1 | 10M |
| 4 | a | Explain methods to overcome racing condition in JK flipflop. | L3 | CO1 | 10M |
| 5 | a | How does a JK flip-flop differ from an SR flip-flop, particularly in terms of its input conditions and output states? | L3 | CO1 | 10M |
| 6 | a | When is a T flip-flop most beneficial, particularly in counter designs, and why is it commonly used in applications requiring toggling? | L2 | CO1 | 10M |
| 7 | a | What is the function of a Parallel-In Serial-Out (PISO) shift register, and how does it process data? | L3 | CO1 | 10M |
| 8 | a | Discuss about Serial Input and Serial Output registers how the data shift happens for each clock pulse. | L3 | CO1 | 10M |
| 9 | a | Differentiate Synchronous and Asynchronous counters and write the applications of Counters. | L3 | CO1 | 10M |
| 10 | a | Explain Universal shift register with a neat diagram. | L2 | CO1 | 10M |

**UNIT-3 PART-A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No** | **Short Answer Questions** | **Level of Bloom Taxonomy** | **CO** | **Marks**  **(2M)** |
| 6 | What is the primary difference between multiprocessors and multicomputer? | L2 | CO2 | 2M |
| 7 | What are the main types of computers? | L1 | CO2 | 2M |
| 8 | What is the role of the control unit in a computer system? | L2 | CO2 | 2M |
| 9 | What is a bus in computer architecture? | L2 | CO2 | 2M |
| 10 | What is the difference between system software and application software | L3 | CO2 | 2M |

**UNIT-3 PART-B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No** | | **Descriptive Questions** | **Level of Bloom Taxonomy** | **CO** | **Marks**  **(10M)** |
| 1 | a | What is the Von-Neumann architecture, and what are its main components and principles? | L3 | CO2 | 10M |
| 2 | a | What are the primary functional units of a computer system, and how do they interact to perform operations? | L3 | CO2 | 10M |
| 3 | a | What is a bus structure in computer architecture, and what are its main components? | L3 | CO2 | 10M |
| 4 | a | What is the difference between multiprocessors and multicomputer, and how do they each enhance computational capabilities? | L2 | CO2 | 10M |