**20EI303**

**Hall Ticket Number:**

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| **II/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **March, 2022** | **Electronics and Instrumentation Engineering** | | |
| **Third Semester** | **Digital Electronics** | | |
| **Time:** Three Hours | | **Maximum:7**0 Marks | |
| *Answer Question No.1 compulsorily.* | | | (14X1 = 14 Marks) |
| *Answer ONE question from each unit.* | | | (4X14=56 Marks) |

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| Answer all questions | | | | **COS** | **BT** |  |
| 1. | a) | | Convert (1010)2 to Hex value? | CO1 | 3 |  |
|  | b) | | Convert decimal number 128 into binary? | CO1 | 3 |  |
|  | c) | | Simplify the Boolean expression xyz+x’y+x’y’z? | CO1 | 2 |  |
|  | d) | | Why NAND and NOR gates are called universal gates? | CO2 | 1 |  |
|  | e) | | Name the two canonical forms of Boolean algebra | CO2 | 1 |  |
|  | f) | | What is a Data selector? | CO2 | 1 |  |
|  | g) | | What is called a latch? | CO3 | 1 |  |
|  | h) | | What is an excitation table? | CO3 | 1 |  |
|  | i) | | What is multiplexer? | CO3 | 1 |  |
|  | j) | | Draw the truth table of jkflipflop? | CO3 | 2 |  |
|  | k) | | What is a state table? | CO4 | 2 |  |
|  | l) | | What do you mean by synchronous counter? | CO4 | 2 |  |
|  | m) | | How many number of flip-flops are required for Mod-16 ring counter? | CO4 | 3 |  |
|  | n) | | What is the width of the address bus of a Rom of size 1024x8 bits? | CO4 | 3 |  |
| **UNIT - I** | | | | | | |
| 2. | a) | Find the value of x in the following?  i) 6125h =(x)2 ii) (1767)10 = (x)8. | | CO1 | 2 | 7M |
|  | b) | i)Implement 3456-1234 using 9’s complement.  ii) Implement 11000-00010 using 1’s complement. | | CO1 | 2 | 7M |
| **(OR)** | | | | | | |
| 3. | a) | List the truth tables of the following function and also realize them using logic gates? F = xy + x’y + y’z + yz | | CO1 | 4 | 7M |
|  | b) | Draw the logic diagrams that implement the following Boolean expression. (A+B)’ (A’+B’) ‘ | | CO1 | 3 | 7M |
| **UNIT - II** | | | | | | |
| 4. | a) | F(A, B,C, D) = ∑m(0,1,2,3,4,7,9,10) . Simplify the Boolean expression using K-Map Method . | | CO2 | 3 | 7M |
|  | b) | Discuss about design of full subtractor? | | CO2 | 2 | 7M |
| **(OR)** | | | | | | |
| 5. | a) | Minimize the following function using Tabular minimization and verify thesameusing K-map simplification?  **F (A, B, C, D) = Σm (0, 1, 2, 5, 7, 8, 9, 10, 13, 15)** | | CO2 | 3 | 7M |
|  | b) | Design a 3-bit BCDto binary code converter. | | CO2 | 2 | 7M |
| **UNIT - III** | | | | | | |
| 6. | a) | Write 4-bit IC magnitude comparator. | | CO3 | 2 | 7M |
|  | b) | Discuss about decimal to binary encoder . | | CO3 | 1 | 7M |
| **(OR)** | | | | | | |
| 7. | a) | Explain Master slave flipflip. | | CO3 | 2 | 7M |
|  | b) | Implement the given function using multiplexer.  F(x, y,z) =∑m (0,2,6,7) | | CO3 | 3 | 7M |
| **UNIT - IV** | | | | | | |
| 8. | a) | Explain the characteristics of logic families? | | CO4 | 2 | 7M |
|  | b) | Draw the logic diagram of programmable Logic array and explain its operation in brief? | | CO4 | 4 | 7M |
| **(OR)** | | | | | | |
| 9. | a) | Draw and explain the operation of CMOS NOT Gate? | | CO4 | 2 | 7M |
|  | b) | Design a BCD to EXCESSS-3 code using PAL? | | CO4 | 3 | 7M |

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