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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations March 2021

DIGITAL LOGIC DESIGN

(Common to CSE & CSIT)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

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|---|--|----|
| 1 | a Define duality property. | 2M |
| | b Define Minterm & Maxterm. | 2M |
| | c Explain Applications of Multiplexer. | 2M |
| | d Define Race Around Condition. | 2M |
| | e What is BIT, BYTE and, WORD. | 2M |

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

- | | | |
|---|---|----|
| 2 | a Convert the following | |
| | a) $(A1D)_{16} = ()_{10}$ | |
| | b) $(453)_8 = ()_{10}$ | 5M |
| | c) $(10110011)_2 = ()_{10}$ | |
| | d) $(5436)_{10} = ()_3$ | |
| | b State and Explain the DeMorgan's Theorem and Consensus Theorem. | 5M |

OR

- | | | |
|---|---|----|
| 3 | a Represent the decimal number 3452 in i) BCD ii) Excess-3 codes. | 5M |
| | b Simplify the following boolean expressions using Boolean algebra: | |
| | i) $A'B(D'+C'D)+B(A+A'CD)$ | 5M |
| | ii) $XYZ'+X'YZ+XYZ+X'YZ'$ | |

UNIT-II

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|---|--|----|
| 4 | a Simplify the Boolean expression using K-MAP
$F(A,B,C,D) = \sum m(1,2,3,8,9,10,11,14) + d(7,15)$ | 5M |
| | b Obtain the Complement of Boolean Expression | |
| | i) $A+B+A'B'C$ | 5M |
| | ii) $AB + A(B+C) + B'(B+D)$ | |

OR

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|---|--|-----|
| 5 | Simplify the Boolean expressions to minimum number of literals | |
| | i) $(A+B)(A+C')(B'+C')$ | |
| | ii) $AB + (AC)' + AB'C (AB+C)$ | 10M |
| | iii) $(A+B)' (A'+B)'$ | |
| | iv) $A'B(D'+C'D)+B(A+A'CD)$ | |

UNIT-III

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|---|--|----|
| 6 | a Design a circuit for a 3x3 bit binary multiplier. | 5M |
| | b What is memory decoding? Explain the construction of 4 X 4 RAM ? | 5M |
| | OR | |
| 7 | a Design a 4 bit binary parallel subtractor and explain operation in detail. | 6M |
| | b Design the combinational circuit of 4 Bit Parallel Adder. | 4M |

UNIT-IV

- 8 a Explain the Logic diagram of the SR flip-flop. 6M
 - b What is state assignment? Explain with a suitable example. 4M
- OR**
- 9 a Enumerate the difference between Combinational & Sequential circuits. 5M
 - b Design and draw the 3-bit up-down synchronous counter. 5M

UNIT-V

- 10 Implement the following function using PLA 10M
 $A(x,y,z) = \sum m(1,2,4,6)$
 $B(x,y,z) = \sum m(0,1,6,7)$
 $C(x,y,z) = \sum m(2,6)$
- OR**
- 11 a Encode the 11-bit code 10111011101 into 15-bit information code. 6M
 - b Explain about the TTL family. 4M

END