

Reg. No:

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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
**(AUTONOMOUS)**  
**B.Tech II Year I Semester (R16) Regular Examinations November 2017**  
**DIGITAL LOGIC DESIGN**  
**(Computer Science & Engineering)**

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 X 12 = 60 Marks)

**UNIT-I**

- 1 a Convert the following  
 i)  $(1AD)_{16} = ( )_{10}$  ii)  $(453)_8 = ( )_{10}$  iii)  $(10110011)_2 = ( )_{10}$  iv)  $(5436)_{10} = ( )_{16}$  4M  
 b Explain the basic properties of Boolean algebra. 8M

**OR**

- 2 a Explain about complements with examples? 8M  
 b Prove that  $ABC + ABC' + AB'C + A'BC = AB + AC + BC$  4M

**UNIT-II**

- 3 Simplify the Boolean expression  
 $f(A,B,C,D,E) = \sum m (0,3,4,7,8,12,14,16,19,20,23,24,26,28)$  12M

**OR**

- 4 Explain NAND- NOR implementations? 12M

**UNIT-III**

- 5 Design a combinational circuit which accepts 3 bit binary number and converts its equivalent Excess 3 code 12M

**OR**

- 6 a Define Multiplexer. Explain in details about the functionality of 8 to 1 Multiplexer. 6M  
 b Design and Explain the operation of Full Adder. 6M

**UNIT-IV**

- 7 a Explain the operation of SR flip-flop using NOR and NAND gate ? 6M  
 b Design and draw the 3 bit up-down synchronous counter? 6M

**OR**

- 8 a Draw and explain the operation of T Flip-Flop? 6M  
 b Explain the operation of Ring counter 6M

**UNIT-V**

- 9 Design a Combinational Circuit using PAL by considering the following Boolean functions given in sum of minterms:  
 $w(A, B, C, D) = \sum (2, 12, 13)$   
 $x(A, B, C, D) = \sum (7, 8, 9, 10, 11, 12, 13, 14, 15)$   
 $y(A, B, C, D) = \sum (0, 2, 3, 4, 5, 6, 7, 8, 10, 11, 15)$   
 $z(A, B, C, D) = \sum (1, 2, 8, 12, 13)$  12M

**OR**

- 10 Explain about Error Detecting and Error correcting codes with example? 12M

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