VIT UNIVERSITY
VELLORE ■ CHENNAI
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School of Computer Science & Engineering

Continuous Assessment Test – I

CSE1003-Digital Logic and Design

Time: 1:30 Hrs | Max.Marks:50

Answers ALL the questions (10×5=50 Marks)

1. a) The solutions to the quadratic equation $x^2 - 13x + 32 = 0$ are $x = 5$ and $x = 4$. What is the base of the numbers? [2]

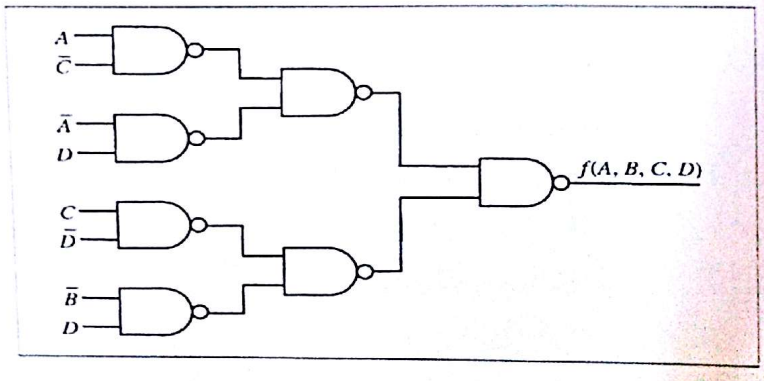
   b) (i) Convert 231.3_4 to base 7. [3]
   (ii) Add -8 and +19 in **2's complement** for a word length of n=8.
   (iii) $(367)_8 * (715)_8$ = ----------

2. Simplify the following Boolean functions to a minimum number of literals and draw the logic circuit for the minimized expression. [5]

   F(A,B,C,D) = [(A+C'+D)(B'+C)(A+B'+D)(B'+C)(B'+C+D')]'

3. A long hallway has three doors, one at each end and one in the middle. A switch is located at each door to operate the incandescent lights along the hallway. Label the switches A, B, and C. Design a logic network to control the lights. [5]

4. Realize the equivalent circuit using NOR gates one for the one shown below: [5]



5. Expand **F(P,Q,R) = P + PQ +QR'** to minterms and maxterms. [5]

6. Dertermine the minimum-cost **POS** expressions for the function [5]

   f(A,B,C,D) = ∑m(4,6,8,10,11,12,15) + d(3,5,7,9)

(P.T.O)

7. Simplify the Boolean function F using the don't care conditions d in **SOP** [5]

   $F = w'(x'y + x'y' + xyz) + x'z'(y+w)$
   $d = w'x(y'z + yz') + wyz$

8. Explain the full subtractor with the neat circuit diagram. [5]

9. Reduce the expression using tabulation method and find the prime implicants [5]

   $F(A,B,C,D) = \sum(0,1,2,3,6,7,13,15)$

10. Design a Combinational circuit that accepts a 3-bit number and generates as output a binary number equal to the square of the input number. [5]

----------ALL THE BEST----------