

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

<b>R-14</b>
-------------

**Code: 4G132**

II B.Tech. I Semester Supplementary Examinations August 2021

**Digital Logic Design**

( Common to CSE & IT )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

\*\*\*\*\*

**UNIT-I**

1. a) Demonstrate n's complement and n-1's complement of a number? Explain it with an example? 7M
- b) List the truth table for the Boolean function
  - (i)  $F = XY + XY' + Y'Z$
  - (ii)  $F = Y'Z + WXY' + WXZ' + W'X'Z$  7M

**OR**

2. a) Express the following functions as a sum of min terms and as a product of max terms:  $F(A,B,C) = B'C + A'C + BC$  6M
- b) What is self-complementary code? Explain with the example 8M

**UNIT-II**

3. a) Why NAND and NOR gates are called as Universal gates? Explain? 6M
- b) For the Boolean function  $F = A'C + A'B + AB'C + BC$ ,
  - (i) Express this function as a sum of Min-terms
  - (ii) Find the minimal sum-of-products expression. 8M

**OR**

4. a) Minimize the function  $F = m(0,2,4,6,7,8,10,12,13,15)$  using K-Map and obtain SOP form of it 7M
- b) Simplify the following Boolean function together with the don't care conditions and simplify into SOP form  
 $F(A,B,C,D) = m(4,5,6,7,12,13,14), d(A,B,C,D) = m(1,9,11,15)$  7M

**UNIT-III**

5. a) Implement a Full-adder using two Half Adders and one OR gate? 7M
- b) Implement a 2-bit Binary Multiplier using logic gates? 7M

**OR**

6. Design a combinational circuit that generates the 9's complement of a BCD digit? 14M

**UNIT-IV**

7. a) Explain the Logic diagram of JK Flip-Flop? 7M
- b) Draw the excitation table of SR, T and D Flip-Flop? 7M

**OR**

8. Explain Universal Shift Register with neat diagram? 14M

**UNIT-V**

9. a) Compare programmable logic devices PROM, PLA and PAL? 8M
- b) Explain about Hamming code? 6M

**OR**

10. Realize the following Boolean function using PROM  
 $F(x, y, z, w) = m(0, 1, 3, 6, 8, 9, 15)$ . 14M

\*\*\*