**Code No: 133AJ** **R16**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**B.Tech II Year I Semester Examinations, November/December - 2018**
**DIGITAL LOGIC DESIGN**
**(Common to CSE, IT)**

**Time: 3 Hours** **Max. Marks: 75**

**Note:** This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

## PART- A

**(25 Marks)**

1.a) Write the advantages of floating-point representation. [2]
b) Distinguish between weighted and non-weighted codes with example. [3]
c) What is the use of don't care combinations? [2]
d) Implement the following function using only NOR Gates F=a.(b+ c) + (b. c). [3]
e) Define a combinational circuit , give its block diagram. [2]
f) Write a short notes on priority encoder. [3]
g) Differentiate between a latch and a flip flop. [2]
h) Define Hazard. Mention various types of hazards. [3]
i) Why programmable AND gates are used in PLA instead of a decoder. [2]
j) Write the applications of logical micro operations. [3]

## PART-B

**(50 Marks)**

2.a) Implement AND, OR, NOR by using NAND gates only.
b) Derive the hamming code for the sequence (101011). [5+5]

**OR**

3.a) Convert the following to the corresponding bases
i) $(343)_5$ = ( $)_6$
ii) $(7654)_8$ = ( $)_{10}$
b) Explain about even and odd parity check with an example, what is the drawback. [5+5]

4.a) Derive the sum of minterms for f(a,b,c,d)=a′b+ab′d+c′d
b) Derive and Implement Exclusive OR function involving three variables using only NAND function. [5+5]

**OR**

5.a) Obtain the simplified expression in POS (product of sums) of F(w,x,y,z)=π(1,2,4,7,12,14,15) using K-maps.
b) Implement the function f(a,b,c)=∑(1,3,4,6) using NOR-NOR two level gate structure. [5+5]

6. Realize a full subtractor using decoders. [10]

**OR**

7.a) Define a multiplexer? Draw a 2:1 multiplexer for the function f(x,y,z)=∑(0,2,3,5,7)
b) Write the steps involved in designing a combinational circuit. [5+5]

8. What is the drawback of JK flip flop, design a flip flop which overcomes this drawback and explain with neat diagram. [10]

**OR**

9.a) Draw the block diagram of asynchronous sequential circuit.

b) Analyze latch with NOR gates, derive transition, flow and state tables. [4+6]

10. Give the logic implementation of a 32 × 4 bit ROM using decoder of a suitable size. [10]

**OR**

11. What do you mean by register transfer? Explain in detail. Also discuss Three state bus buffer. [10]

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