

Code No: 113BS

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, May/June - 2015

DIGITAL LOGIC DESIGN

(Computer Science and Engineering)

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.

PART- A

- (25 Marks)
- Write about floating point representation. [2M]
 - Find the 2's complement for -7. [3M]
 - Write the canonical form of the following expression:
 $F(A,B,C,D) = A' + BC + CD'$ [2M]
 - Implement Ex-OR gate using $d \times 1$ MUX. [3M]
 - Draw the logic diagram for 4×2 encoder. [2M]
 - Draw the block diagram for full adder using half adders and gates. [3M]
 - Compare latch and flip flop. [2M]
 - What are the drawbacks of ripple counters? [3M]
 - Define the following terms: i) Hit ratio ii) Access time. [2M]
 - Draw the memory hierarchy in terms of capacity and access time. [3M]

PART-B

- (50 Marks)
- Solve for x
i) $(367)_8 = (x)_2$ ii) $(378.93)_{10} = (x)_8$
iii) $(B9F.AE)_{16} = (x)_8$ iv) $(16)_{10} = (100)_x$
 - Convert $(163.875)_{10}$ to binary, octal, hexadecimal. [6+4]
- OR**
- What are universal gates? Realize AND, OR, NOT, XOR gates using universal gates.
 - Obtain the canonical SOP form of the following functions.
i) $Y(A,B) = A+B$. ii) $Y(A,B,C,D) = AB+ACD$. [6+4]
- Simplify the expression $Y = \sum m(7,9,10,11,12,13,14,15)$ using the k-map method.
 - Simplify the following Boolean function:
 $F(A,B,C,D) = \sum m(1,3,7,11,15) + \sum d(0,2,5)$ [5+5]
- OR**
- Simplify $Y = \sum m(3,6,7,8,10,12,14,17,19,20,21,24,25,27,28)$ using K-map method.
 - Obtain:
i) Minimal SOP and
ii) Minimal POS expressions for the following function:
 $F(A,B,C,D) = \sum m(0,1,5,8,9,10)$ [5+5]