Code No: 133AJ **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, April/May - 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) Convert $(67A9)_{16}$ into decimal. [2]
b) Add (+80) and (-70) using 2's complement. [3]
c) Write the truth table of Ex-OR Gate. [2]
d) Implement OR gate using NAND gates only. [3]
e) Write the truth table of half adder. [2]
f) Design half sub tractor circuit. [3]
g) Differentiate between Latch and flip flop. [2]
h) Draw the circuit diagram of Ring counter. [3]
i) Differentiate between RAM and ROM. [2]
j) Name any 3 logic micro operations. [3]

PART-B

(50 Marks)

2.a) i) Convert $(657)_8$ into decimal.
ii) Convert $(2348)_{10}$ into hexa decimal.
b) Represent the decimal number 46.5 as a floating point number with 16 bit mantissa and 8 bit exponent. [5+5]

OR

3.a) i) Convert 110001.1010010 into hexadecimal.
ii) Convert $(423.25)_{10}$ into Hex.
b) i) Simplify A(B+C)+AB+ABC
ii) Write the truth table and symbols of AND and OR gates. [5+5]

4. Obtain the simplified expression in sum of products for the following Boolean function.
a) $F(A,B,C,D) = \sum(2,3,12,13,14,15)$.
b) $BDE+B'C'D+CDE+A'B'CE+A'B'C+B'C'D'E'$ [5+5]

OR

5. Obtain the simplified expression in product of sums.
a) $F(A,B,C,D) = \pi(0,1,2,3,4,10,11)$
b) $F(A,B,C,D) = \pi(1,3,5,7,13,15)$ [5+5]

6.a) Design half adder using only NAND gates.
b) Design a combinational circuit which converts BCD to Excess-3 code. [5+5]

OR

7.a) Design a 2 bit magnitude comparator.
b) Implement 4*16 decoder using two 3*8 decoders. [5+5]

8.a) Explain a right shift register.
b) Design a 3 bit Ripple counter. [5+5]

OR

9.a) What is a hazard? How do you eliminate hazards?
b) Design and explain Johnson counter. [5+5]

10.a) Explain different types ROMs.
b) Implement the following Boolean functions using PLA with 3 AND gates:
$F_1 (ABC) = \sum (3,5,7)$, $F_2 = \sum(4,5,7)$. [5+5]

OR

11.a) Explain the applications of Logic micro operations.
b) Explain shift Right and Left with examples. [5+5]

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