

Code No: 133AJ

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 subtractor 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) $BDE+B'CD+CDE+AB'CE+AB'C+B'CD'E'$ [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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