

R16

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.
- b) Add $(+80)$ and (-70) using 2's complement.
- c) Write the truth table of Ex-OR Gate.
- d) Implement OR gate using NAND gates only.
- e) Write the truth table of half adder.
- f) Design half subtractor circuit.
- g) Differentiate between Latch and flip flop.
- h) Draw the circuit diagram of Ring counter.
- i) Differentiate between RAM and ROM.
- j) Name any 3 logic micro operations.

[2]
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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) $BDE+B'C'D+CDE+A'B'CE+A'BC'+B'C'D'E'$

[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]

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- 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.

$$F_1(ABC) = \sum (3,5,7), \quad F_2 = \sum (4,5,7).$$

[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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