Code No: 133AJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, November/December - 2017

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) Subtract the following using 1's and 2's complement $(101)_2 - (10110)_2$. [2]

b) Distinguish between canonical and standard forms by giving an example. [3]

c) Derive the sum of minterms for the function $f(a,b,c)=a'b+b'c'$ [2]

d) Implement the following function using only NAND Gates $F=a.(b'+c')+(b.c)$. [3]

e) Differentiate multiplexer and de-multiplexer. [2]

f) Draw the diagram of 4-Bit Parallel adder cum parallel subtractor. [3]

g) Show the excitation table and truth table of JK flip flop. [2]

h) Differentiate critical and non-critical race. [3]

i) Define Register Transfer Language. [2]

j) Differentiate PLA and PAL. [3]

PART-B

(50 Marks)

2.a) What are the various logic gates, give the representation along with the truth table.

b) What is the use of complements? Perform subtraction using 7's complement for the given Base-7 numbers $(565)-(666)$. [5+5]

OR

3.a) Convert the following to the corresponding bases

i) $(9BCD)_{16} = (\quad)_8$

ii) $(323)_4 = (\quad)_5$

b) Given the 8 bit data word 11011011, generate the 12 bit composite word for the Hamming code that corrects and detects single errors. [5+5]

4.a) Derive the product of maxterms for $f(a,b,c,d)=a.b.c+b'.d+c.d'$.

b) Derive and Implement Exclusive OR function involving three variables using only NAND function. [5+5]

OR

5.a) Obtain the simplified expression in SOP form of $F(a,b,c,d,e)=\sum(1,2,4,7,12,14,15,24,27,29,30,31)$using K-maps.

b) Implement the function $f(a,b,c)=\pi(0,1,3,4)$ using NAND-NAND two level gate structure. [5+5]

8.a) Illustrate and explain the working of LVDT.
 b) Describe the hotwire anemometer and explain.   [5+5]

OR

9.a) Explain the principle of working of synchros.
 b) Describe the magneto strictive transducers.   [5+5]

10.a) A Maxwell bridge is used to measure an inductive impedance. The bridge constants at balance are C1 = 0.01 µF, R1 = 470 KΩ, R2 = 5.1 KΩ and R3 = 100 Ω. Find the series equivalent of the unknown impedance.
 b) Discuss the measurement of Moisture.   [5+5]

OR

11.a) Describe any one bridge circuit for the measurement of inductance.
 b) Explain a method of measurement of liquid level.   [5+5]

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