

R16

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)

- Subtract the following using 1's and 2's complement $(101)_2 - (10110)_2$. [2]
- Distinguish between canonical and standard forms by giving an example. [3]
- Derive the sum of minterms for the function $f(a,b,c)=a'b+b'c'$. [2]
- Implement the following function using only NAND Gates $F=a.(b'+c')+(b.c)$. [3]
- Differentiate multiplexer and de-multiplexer. [2]
- Draw the diagram of 4-Bit Parallel adder cum parallel subtractor. [3]
- Show the excitation table and truth table of JK flip flop. [2]
- Differentiate critical and non-critical race. [3]
- Define Register Transfer Language. [2]
- Differentiate PLA and PAL. [3]

PART-B

(50 Marks)

- What are the various logic gates, give the representation along with the truth table.
 - What is the use of complements? Perform subtraction using 7's complement for the given Base-7 numbers $(565)-(666)$. [5+5]
- OR**
- Convert the following to the corresponding bases
i) $(9BCD)_{16} = (\quad)_{8}$
ii) $(323)_4 = (\quad)_5$
 - 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]
- Derive the product of maxterms for $f(a,b,c,d)=a.b.c+b'.d+c.d'$.
 - Derive and Implement Exclusive OR function involving three variables using only NAND function. [5+5]
- OR**
- Obtain the simplified expression in SOP form of $F(a,b,c,d)=\sum(1,2,4,7,12,14,15,24,27,29,30,31)$ using K-maps.
 - Implement the function $f(a,b,c)=\pi(0,1,3,4)$ using NAND-NAND two level gate structure. [5+5]

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

OR

- 9.a) Explain the principle of working of synchros. [5+5]
- 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 $C1 = 0.01 \mu F$, $R1 = 470 K\Omega$, $R2 = 5.1 K\Omega$ and $R3 = 100 \Omega$. Find the series equivalent of the unknown impedance. [5+5]
- b) Discuss the measurement of Moisture. [5+5]

OR

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

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