C.U.SHAH UNIVERSITY
Summer Examination-2018

Subject Name : Digital Electronics and Digital Instruments

Subject Code : 2TE04DEI1   **Branch: Diploma (Electrical)**

Semester : 4   **Date : 05/05/2018**   **Time : 10:30 To 01:30**   **Marks : 70**

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1   **Attempt the following questions:**   (14)

a) A+A = _____
   1. 0
   2. 1
   3. A
   4. A^2

b) If A= 01001 , A''=
   1. 10111
   2. 01001
   3. 11011
   4. 10110

c) How many Inputs does full adder has?
   1. 1
   2. 2
   3. 3
   4. 4

d) The number of digits in Octadecimal system are:-
   1. 10
   2. 15
   3. 16
   4. 8

e) Full form of POS is:-
   1. Some of Parts
   2. Sum of Product
   3. Some of Product
   4. Sum of power

f) Which Gate works as Universal Gate?
   1. EX-OR   3. NAND
   2. EX-NOR   4. OR

g) $(101)2 + (011)2 = ($_____$)2$

1. 1000
2. 101
3. 1010
4. 112

h) A small circle on the output of a logic gate is used to represent the:
   1. Comparator operation.
   2. OR operation.
   3. NOT operation.
   4. AND operation.

i) The format used to present the logic output for the various combinations of logic inputs to a gate is called a(n):
   1. Truth table.
   2. Input logic function.
   3. Boolean constant.
   4. Boolean variable.

j) Which of the examples below expresses the distributive law?
   1. $(A + B) + C = A + (B + C)$
   2. $A(B + C) = AB + AC$
   3. $A + (B + C) = AB + AC$
   4. $A(BC) = (AB) + C$

k) Which of the following is a form of De Morgan's Theorem?
   1. $\overline{X + Y} = \overline{X} + \overline{Y}$
   2. $X(1) = X$
   3. $\overline{XY} = \overline{X} + \overline{Y}$
   4. $X + 0 = 0$

l) Which of the following expressions is in the sum-of-products (SOP) form?
   1. $(A + B)(C + D)$
   2. $(A)B(CD)$
   3. $AB(CD)$
   4. $AB + CD$

m) Applying DeMorgan's theorem to the expression $\overline{ABC}$, we get _____.
   1. $\overline{A + B + C}$
   2. $\overline{A} + \overline{B} + \overline{C}$
   3. $A + \overline{B} + C\overline{C}$
   4. $A(B + C)$

n) The systematic reduction of logic circuits is accomplished by:
   1. using Boolean algebra
   2. symbolic reduction
   3. TTL logic
   4. using a truth table.

Attempt any four questions from Q-2 to Q-8

Q-2　　　　**Attempt all questions**　　　　　　　　　　　　　　　　**(14)**

　A　　Solve the following:　　　　　　　　　　　　　　　　　　　　(2)

1. $(11011011)_2 + (0101101)_2$ (2)

2. $(1101.110)_2 - (100.011)_2$ (3)

3. $(11001.101)_2 * (11.101)_2$

B Explain NAND & NOR Gates with Figures and Truth Tables. (7)

Q-3 **Attempt all questions** **(14)**
A Write De-Morgan's Theorem. Explain with the help of neat and clean figure. (7)

B Find SOP:- (7)
  $Y = f (A, B , C ,D) = ABCC + ABB + AAC$
  Find POS:-
  $Y = f (A, B , C ,D) = (A+BB)(A+CC)(A+BB+D)$

Q-4 **Attempt all questions** **(14)**
A Draw and Explain Block Diagram of D/A Converter. Give types of D/A Converter. (7)
B Explain BCD to Seven Segment Decoder. (7)

Q-5 **Attempt all questions** **(14)**
A Draw the logic diagrams for the following:- (7)
  i. $Y = AB+AB+BC$
  ii. $Y = ABC+ABD+AC$
  iii. $Y = (A+B)(A+C)(A+B+D)$

B Write the types of A/D Converter. Explain any one A/D Converter with neat and clean figure. (7)

Q-6 **Attempt all questions** **(14)**
A What is Encoder? Explain Octal to Binary encoder. (7)

B What is Flip-Flop? Explain R-S Flip Flop with block diagram, logic diagram and truth table. (7)

Q-7 **Attempt all questions** **(14)**
A Explain Basic Building Blocks Of Digital Instruments. (7)

B Explain half adder with the help of necessary diagram. (7)

Q-8 **Attempt all questions** **(14)**
A Explain J-K And Master Slave J-K Flip Flop. (7)

B Explain Watt Meter. (7)