Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name: Digital Electronics

Subject Code: 4TE03DEL1 Branch: B.Tech (CE,EC)

Semester: 3 Date :28/04/2016 Time :2:30 To 5:30 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) Define Bit.
b) Define Byte.
c) Define Nibble.
d) Define Word.
e) What is 2's complement of $(1101001)_2$?
f) What is 1's complement of $(1101001)_2$?
g) $(11110001)_2 = (\quad)_8$
h) $(222)_{10} = (\quad)_8$
i) Find the 9's complement of $(456)_{10}$
j) $(222)_{10} = (\quad)_{16}$
k) $(\text{BAD})_{16} = (\quad)_{10}$
l) $(55)_8 = (\quad)_2$
m) $(100)_8 = (\quad)_{16}$
n) $(AA)_{16} = (\quad)_2$

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

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

(a) What is TTL logic? Explain this logic in detail.
(b) State and prove De'Morgan's Theorems with the help of truth tables.

Q-3 **Attempt all questions** **(14)**

(a) Prove that ABC + ABC' + AB'C + A'BC = AB + AC + BC
(b) What is K- Map? Explain the SOP and POS in detail.

Q-4 **Attempt all questions** **(14)**

(a) Discuss Full Adder with detailed circuit diagram and truth table.
(b) Implement EX-OR and EX-NOR gate with NAND gates. Justify your answer with truth table.

Q-5 **Attempt all questions** **(14)**

(a) Simplify with K- Map F(w, x, y, z) = $\sum$ (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)

(b) Simplify with K- Map in SOP and POS: F(A, B, C, D) = $\sum$ (0, 1, 2, 5, 8, 9, 10)

Q-6 **Attempt all questions** **(14)**

(a) What is 8421 BCD code? Explain in detail and represent the code for 0 to 9 decimal.

(b) Explain 3 to 8 line decoder with circuit and truth table.

Q-7 **Attempt all questions** **(14)**

(a) Design Full-adder with 3 to 8 line decoder.

(b) What is Master –Slave JK Flip-Flop? Explain it with figure and truth table.

Q-8 **Attempt all questions** **(14)**

(a) Explain 4 bit Asynchronous counter with necessary figures.

(b) Compare RAM and ROM in detail. Describe Applications of RAM and ROM.