

Enrollment No: _____

Exam Seat No: _____

C.U.SHAH UNIVERSITY

Winter Examination-2022

Subject Name : Digital Electronics

Subject Code : 4TE03DEL1

Branch: B.Tech (CE)

Semester: 3

Date: 12/01/2023

Time: 02:30 To 05:30

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.
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- Q-1** **Attempt the following questions:** **(14)**
- a) $X + X = \underline{\hspace{2cm}}$. 1
a. X b. 2X c. 0 d. 1
- b) Find out binary Subtraction of $1010110 - 101010$ 1
- c) $(15)_{10} = (?)_2$ 1
a. 1110 b. 0111 c. 1111 d. 1011
- d) $(1011)_2 = (?)_{10}$ 1
a. 10 b. 11 c. 12 d. 13
- e) $(1100)_2 = (?)_8$ 1
a. 14 b. 11 c. 12 d. 13
- f) An AND gate has 4 inputs. The number of input words in its truth table are 1
a. 4 b. 16 c. 64 d. 128
- g) 1 Byte = bits. 1
a. 10 b. 8 c. 12 d. 4
- h) The number of control lines for a 16 – to – 1 multiplexer is 1
a. 1 b. 8 c. 2 d. 4
- i) Radix of Hexadecimal number system is 1
a. 10 b. 8 c. 12 d. 16
- j) A flip-flop can store bit(s) of data. 1
a. 1 b. 4 c. 8 d. 16



- k) How many Flip-Flops are required for mod-16 counter? 1
 a. 2 b. 6 c. 3 d. 4
- l) $X \cdot 1 = \underline{\hspace{2cm}}$. 1
 a. X b. 2X c. 0 d. 1
- m) What is a quad? 1
 n) Give definition of combinational circuit. 1

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

- Q-2 Attempt all questions (14)**
 (a) State and explain De Morgan's theorem. 7
 (b) What is logic circuit? Draw circuit diagram and truth tables of basic logic gates. 7
- Q-3 Attempt all questions (14)**
 (a) What is flip flop? Explain R-S flip flop in detail. 7
 (b) Explain Sum of Product and Simplify $\Sigma(3,7,11,12,13,14,15)$ 7
- Q-4 Attempt all questions (14)**
 (a) Explain full adder with circuit diagram and truth table. 7
 (b) Explain POS and Simplify $\pi(0,1,2,4,5,6,8,9,10)$ 7
- Q-5 Attempt all questions (14)**
 (a) What is Register? Explain 8-bit Shift Register with proper circuit. 7
 (b) Draw following circuit. 7
 1) $f = ab + a'b'$
 2) $f = a'b + b'c + ac'$
- Q-6 Attempt all questions (14)**
 (a) Explain Master Slave flip flop in detail. 7
 (b) What is Asynchronous Counter? Explain 8-bit Shift Counter. 7
- Q-7 Attempt all questions (14)**
 (a) Draw circuit diagram and truth table for Universal Gates. 4
 (b) Explain 3 to 8 line decoder with circuit diagram and truth table. 5
 (c) Simplify following Boolean function using K-map $F(w,x,y,z) = \Sigma(1,3,7,11,15)$ 5
- Q-8 Attempt all questions (14)**
 (a) Explain TTL with their different types. 7
 (b) Write short notes on MOS and CMOS. 7

