Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Winter Examination-2019

Subject Name: Digital Circuits

Subject Code: 4TE03DCI1 **Branch: B.Tech (Electrical)**

Semester : 3 **Date : 18/11/2019** **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.

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

1) Gray code is representation of 14 is
(a) 1010 (b) 1100 (c) 1001

2) The NAND gate output will be low if the two inputs are
(a) 00 (b) 01 (c) 10 (d) 11

3) What is the binary equivalent of the decimal number 368
(a) 101110000 (b) 110110000 (c) 111100000 (d) 111010000

4) The number of control lines for a 8 to 1 multiplexer is
(a) 2 (b) 3 (c) 5 (d) 4

5) The digital logic family which has minimum power dissipation is
(a) TTL (b) RTL (c) DTL (d) CMOS

6) The 2' s complement of the number 1101101 is
(a) 0101110 (b) 0111110 (c) 0010011 (d) 01100010

7) The number F represents _____ number in hexadecimal system.
(a) 11 (b) 10 (c) 14 (d) 15

8) Which type of logic gate is also known as an inverter?
(a) OR gate (b)NAND gate (c) NOT gate (d) None of the above

9) Any basic gate can be used in combinational logic circuit.
(a) True (b) False

10) The bit 0 and 1 represents _____number system.
(a) Binary (b) Octal (c) Hexadecimal (d) Decimal

11) What is the full form of BCD?

12) In the positive logic system 1 is high and 0 is low.
(a) True (b) False

13) Define Digital system.

14) A flip flop has two outputs which are ____
(a) Always 0 (b) Always 1 (c) Always complementary (d) None of the above

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

Q-2		**Attempt all questions**	**(14)**
	(a)	Which gates are known as universal gates? Draw the universal gates with the help of circuit diagrams and truth tables.	**07**
	(b)	Simplify F(A,B,C,D)= Σ (0,1,2,4,5,6,8,9,12,13,14) using four variable K-Map.	**07**
Q-3		**Attempt all questions**	**(14)**
	(a)	Do as directed: (i) Convert $(101101)_2$ to decimal (ii) Convert $(64)_{10}$ to binary (iii) Convert (A159F)16 = (_____)8	**07**
	(b)	Draw the logic diagram and truth table of half subtractor. Write its Boolean expression and explain its operation.	**07**
Q-4		**Attempt all questions**	**(14)**
	(a)	Draw the logic diagram and truth table of J-K flip flop and explain its operation.	**07**
	(b)	Design a 4 bit BCD to Gray code converter.	**07**
Q-5		**Attempt all questions**	**(14)**
	(a)	Explain TTL logic families in details.	**07**
	(b)	Explain the working of 4 bit asynchronous up counter.	**07**
Q-6		**Attempt all questions**	**(14)**
	(a)	Draw the logic diagram of 4 bit buffer register and explain its operation.	**07**
	(b)	What is meant by multiplexer? Explain with diagram and truth table of 4 to 1 line multiplexer.	**07**
Q-7		**Attempt all questions**	**(14)**
	(a)	Simplify (a) Z= (A+C)(A+D)(B+C)(B+D) (b) Z= (B+BC)(B+B'C)(B+D)	**07**
	(b)	Design and implement a 3 line to 8 line decoder.	**07**
Q-8		**Attempt all questions**	**(14)**
	(a)	What are the applications of shift register?	**07**
	(b)	Describe the comparisons of counters with registers.	**07**