Enrollment No: _____     Exam Seat No:_____

# C.U.SHAH UNIVERSITY
# Winter Examination-2021

**Subject Name: Digital Electronics**

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

**Semester: 3**      **Date: 17/01/2022**      **Time : 11:00 To 02:00**      **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)**  Define Quad word.                                                                1
   **b)**  Find out binary Subtraction of $1010110 - 101010$                                1
   **c)**  $2^{nd}$ complement of 0001 is                                                    1
           a) 1101 b) 0111  c)1100  d)1111
   **d)**  Solve $(1001)_2 = (?)_{10}$                                                      1
   **e)**  In Excess-3 code each coded number is .......than in BCD code.                   1
           (a) Four larger (b) three smaller (c) three larger (d) much larger.
   **f)**  Find out $1^{st}$ complement of 110011.                                          1
   **g)**  Find out $2^{nd}$ complement of 1010.                                            1
   **h)**  What is Fan-out?                                                                 1
   **i)**  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
   **j)**  $1^{st}$ complement of 1101                                                      1
           a)0010 b) 0101  c)1100  d)1111.
   **k)**  J-K Flip Flop derive from _____?                                               1
           (a) T Flip Flop  (b) R-S Flip Flop (c) D Flip Flop  (d) None
   **l)**  Find out gray to binary number system of 1010.                                  1
   **m)**  How many Flip-Flops are required for mod–16 counter?                            1
           (a) 2 (b) 6 (c) 3 (d) 4
   **n)**  The number of control lines for a 16 – to – 1 multiplexer is                    1
           (a) 2 (b) 3 (c) 4 (d) 5

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

**Q-2**          **Attempt all questions**                                                  **(14)**
   **(a)**  What is Logic Circuit? List out category of Logic gate. Explain Basic gate.     7
   **(b)**  Explain 2 to 4 line Decoder with proper circuit.                                7

**Q-3**          **Attempt all questions**                                                  **(14)**
   **(a)**  Prove associative law and distributive laws using truth table                  7
   **(b)**  Explain clocked R-S flip flop. Explain disadvantage of R-S flip flop.          7

| Q-4 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **(a)** | Explain full adder with Truth table. | **7** |
| | **(b)** | Draw circuit of Basic Gates using NAND & NOR Gates. | **7** |

| Q-5 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **(a)** | What is Shift Register? Explain 8-bit Shift Register with proper circuit. | **7** |
| | **(b)** | What is Karnaugh Map? Draw Structure of different types of k-map variable combination. | **7** |

| Q-6 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **(a)** | Explain Master Slave Flip Flop with proper circuit. | **7** |
| | **(b)** | What is Asynchronous Counter? Explain 4-bit Shift Counter. | **7** |

| Q-7 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **(a)** | Write a note on Binary Ripple Counter. | **7** |
| | **(b)** | What is Multiplexer? Explain 4 to 1 line Multiplexer. | **7** |

| Q-8 | | **Attempt all questions** | **(14)** |
|---|---|---|---|
| | **(a)** | Explain SOP and Simplify $\sum(4,5,6,7,12,13,14,15)$. | **7** |
| | **(b)** | Write notes on MOS and CMOS. | **7** |