C.U.SHAH UNIVERSITY
Winter Examination-2015

Subject Name: Digital Circuits
Subject Code: 4TE03DCI1   **Branch: B.Tech (EEE,EE,IC)**

Semester: 3   Date: 05/12 /2015   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)**

  a) Define Digital System.
  b) Convert $(11011.101)_2$ to Decimal.
  c) Convert $(10101111001.0111)_2$ to Octal.
  d) Convert $(1011011011)2$ to Hexadecimal.
  e) Convert $(5497)10$ to Binary.
  f) Convert $(378.93)10$ to Octal.
  g) Convert $(2598.675)10$ to Hexadecimal.
  h) Convert $(4057.06)8$ to Decimal.
  i) Convert $(5C7)16$ to Decimal.
  j) Convert $(367.52)8$ to Binary.
  k) Convert $(3A9E.B0D)16$ to Binary.
  l) State De Morgan's Theorem.
  m) Define Flip Flops.
  n) State the types of Shift Registers.

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

Q-2   **Attempt all questions**   **(14)**
  A Explain NAND and NOR gate as an universal gate.   **8**
  B Describe S-R flip-flop and its applications.   **6**

Q-3   **Attempt all questions**   **(14)**
  A Simplify: a) Y= (A+C)(A+D)(B+C)(B+D)   **8**
              b) Y= (B+BC)(B+B'C)(B+D)
  B Explain half and full adders in detail.   **6**
Q-4   **Attempt all questions**   **(14)**
  A Simplify the following Boolean function using K-map and realize using basic
        gates.
        F(A,B,C,D) = Σm(0,1,5,9,13,14,15) + with don't care conditions d(3,4,7,10,11)

B   Design a 4 bit BCD to Gray code converter.

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

A   What is meant by multiplexer? Explain with diagram and truth table the Operation of 4-to-1 line multiplexer.

B   What is meant by decoder? Explain 3-to-8 line decoder with diagram and truth table.

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

A   Explain D type positive edge triggered flip flop.

B   Explain the working of the Master Slave J K flip-flop with necessary logic diagram.

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

A   With neat diagram explain the operation of 4- bit serial- in-serial –out register. Draw the timing diagram and give its truth table.

B   With necessary sketch explain bi-directional shift register with parallel load.

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

A   Explain the working of 4 bit asynchronous up counter.

B   Describe the Comparison of Counters with Registers.