TEC-302 1158

Odd Semester Examination, 2017-18

B.TECH. (SEMESTER-III)

DIGITAL ELECTRONICS AND DESIGN ASPECTS

Time: 3.00 Hours **Max Marks : 100**

Note - Attempt **all** questions. All questions are compulsory.

1. Attempt **any four** questions: [5x4=20]

   (a) What is multiplexer? Draw 4 lines to 1 line multiplexer and explain its working.

   (b) Design mod-3 counter

   (c) Convert the following binary number into

      (i) Gray code

      (ii) Excess-3 code

         (A) 110

         (B) 1011

         (C) 11100

         (D) 101110

         (E) 100001

   (d) Enumerate the features of Hamming code? How error correction is possible using this code?

   (e) What is the difference between a latch and a flip-flop

2. Attempt **any four** questions: [5x4=20]

   (a) Simplify the expression using K Map

   $S=\sum(0,1,2,3,8,9,10,11,15)+d(4,5,14)$

   (b) Draw a two input TTL NAND gate and explain its operation.

(c) Implement the following function using don't care condition:

F=B'D+B'C+ABCD

d=A'BD+AB'C'D'

(d) A combinational circuit is defined by the following three functions

$F_1=x'y'+xyz'$, $F_2=x'+y$, $F_3=xy+x'y'$ design the circuit with a decoder and external gates

(e) Design a 4-bit universal shift register using SR flip flop

(f) design a negative edge triggered mod -11 ripple up counter using JK flip flop

3. Attempt **any two** questions [10x2=20]

(a) Draw the neat and clean diagram of master slave JK flip flop and explain its working by giving truth table. how master slave JK flip flop is different from JK flip flop

(b) Write short notes on:

(i) Carry look ahead generator

(ii) Sequence generator

(iii) EPROM

(iv) Hazards

(c) What is Johnson's counter? construct the Johnson's counter with 8 timing signal.

4. Attempt **any two** questions : [10x2=20]

(a) Draw the block diagram of typical MOS static memory and explain the organization.

(b) What are the advantages of Tri state buffer? Explain the designing of Tri state inverter using totem pole output.

(c) Design a 4- bit magnitude comparator and also implemented it with the help of basic gates.

5. Attempt **any two** questions : [10x2=20]

(a) Explain how shift register can be used as

(i) Serial to parallel data converter, and

(ii) Parallel to serial data converter

(b) What is encoder? Draw the schematic of a general encoder with X inputs. Explain briefly its operation. Give the logic circuits and truth table for an octal- to- binary sample encoder with active- low inputs.

(c) Explain FLIP FLOP in detail.

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