Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ECE) (Sem.–6)

DIGITAL SYSTEM DESIGN

Subject Code : BTEC-904

M.Code : 71233

Date of Examination : 14-07-22

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

a) Design a full adder using half adders.

b) With the help of an example differentiate between truth table and excitation table.

c) Give the comparison between Synchronous & Asynchronous counters.

d) What is a binary cell?

e) What are the different techniques used in state assignment?

f) List two essential properties that a digital system must have in order to be classed as a sequential circuit.

g) What is HAZARD and its types? Give an example of sequential circuit that will generate a hazard?

h) Define the critical race and non-critical race.

i) What is programmable logic array? How it differs from ROM?

j) Explain how and ASM chart differs from a software flow chart.

SECTION -B

2. With the help of 4:1 MUX, generate the following function:

   F (A, B, C, D) = Σ (0, 1, 3, 5, 8, 13, 14)

3. Design a binary counter using T flip flops to count in the following sequence: 000, 001, 010, 011, 100, 101, 111, 000.

4. With an example, explain the use of ASM charts in the design of digital circuits.

5. Explain the steps involved in the Design of Asynchronous Machines with any example.

6. Implement the following function using PLA :

   A(x,y,z) = Σm(l,2,4,6)

   B(x,y,z) = Σm(0,l,6,7)

   C(x,y,z) = Σm(2,6).

SECTION-C

7. Design a Mod-6 counter using SR flip-flop and also convert it into counter using JK flip-flop.

8. Design an asynchronous sequential circuit with 2 inputs X and Y and with one output Z Wherever Y is 1, input X is transferred to Z. When Y is 0; the output does not change for any change in X. Use SR latch for implementation of the circuit.

9. Explain the structural difference between a ROM and a PLA and implement the following function using ROM and PLA design: F(A, B, C, D) = Σ (0,1,3,6,8,9,10,12,15)

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.