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

Total No. of Questions : 09

B.Tech.(Automation & Robotics) (DE-I 2011 & Onward)
B.Tech.(ECE/ ETE) (E-I 2019 Onwards)
(Sem.–6)

DIGITAL SYSTEM DESIGN

Subject Code : BTEC-904
M.Code : 71233

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) Define the race around condition. How can it be avoided?

b) Covert the JK flip flop into D flip-flop.

c) What is an ASM chart? What are its basic elements?

d) What are the problems associated with a ripple counter?

e) Realize NAND and OR gates using 2:1 MUX.

f) What is a flip flop and how is it different from a latch?

g) Define a Mealy machine.

h) If three mod 16 counters are used in cascade, What will the maximum counting range?

i) What is the role of a delay element in an asynchronous sequential circuit?

j) What is a transition table and how is it different from a flow table?

SECTION-B

2. Design a 4 bit BCD adder.

3. Derive the characteristic equations and the excitation tables for SR, JK, T and D type flip flops.

4. Differentiate between PROM, PLA and PAL.

5. What are the differences between synchronous and asynchronous sequential circuits?

6. A combinational logic is defined by the function :

   $F_1(A,B,C) = \Sigma m(3,5,6,7)$

   $F_2(A,B,C) = \Sigma m(0,2,4,7)$

   Implement the circuit with PLA having three inputs, four product terms and two outputs.

SECTION-C

7. Design a counter that goes through the states 0, 3, 5, 6, 0,….. using T flip flops (only). Show how the lock out condition is taken care of.

8. What are static and dynamic hazards? Implement the circuit for the following function after removing various hazards.

   $F(A,B,C) = \Sigma m (0,1,3,4,6,7)$

9. Design a sequence generator using JK flip flop for the sequence : 1001001.

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.