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

Total No. of Questions : 08

M.Tech. (Emb sys) (2016 & Onwards) (Sem.–1)

ADVANCED DIGITAL SYSTEM DESIGN

Subject Code : MTED-102

Paper ID : [74131]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

Q1 a) Solve the following :

i) $(854013)_8$-$(725360)_8$.

ii) -48-23 using 2's complement method.

iii)$(1256)_{16}$ + $(3DFF)_{16}$. (6)

b) Reduce the following function using k-map and realize using NAND gate and NOR gate. (14)

$F = \sum m(1,2,3,6,8,9,14,17,24,26,27,30,31) + \sum d(4,5)$

Q2 a) Describe the various design steps of asynchronous machine. (10)

b) With the help of examples discuss the hazards in circuits developed by MEV method. (10)

Q3 a) Write a procedure to add two n-bit vectors in VHDL. (10)

b) Develop a functional model for a full adder using selective signal assignment statement. (10)

Q4 Design a sequential circuit using D- flip flop with function as per the state diagram shown below.

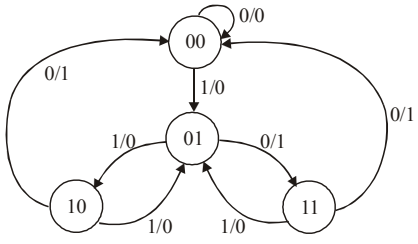

Fig.1

Q5 a) Explain the D-algorithm with suitable example. (10)

b) What do you understand by built-in self test? Differentiate between exhaustive and pseudo exhaustive testing. (10)

Q6 a) Write a short note on packages and libraries.

b) What are generics? Explain the role of generics in VHDL with suitable example. (10)

Q7 a) Discuss in detail about bridging fault model. (10)

b) Describe the algorithm steps involved in PODEM. (10)

Q8 Implement the following using FPGA : (20)

a) 4:1 MUX

b) 8×8 ROM