EC - 605 B.E. VI Semester

Examination, December 2014

VLSI Circuits and Systems



Time: Three Hours Maximum Marks: 70

Note: Attempt only one question from each unit. Each question carry equal marks.

Unit -1

1.a) Prove that p - MOS pass strong logic' 1' and n-MOS pass strong logic'0'. b) Explain the following:

i) Regularity ii) Modularity iii) Locality

OR

2.a) Explain the implementation of a CMOS positive level sensitive D latch and CMOS positive Edge triggered D Register.

b) Write an introductory note on Computer Aided Design (CAD) tools.

Unit-II

3.a) State the difference between Mealy and Moore machine. Give simple example and draw the state transition diagram for the two.

b) Explain the following memory elements

i) D flip-flop ii) T flip-flop

iii) S-R flip-flop iv) J.K flip-flop

OR

4.a) Explain the state minimization of completely specified machine by using tabular method,

b) Design a circuit which gives o/pz = 1 ifx(t) =x(t-2)

Unit-III

5.a) Explain secondary state assignment in sequential machines.

b) Describe in brief critical and non critical races.

OR

6.a) Explain hazards in sequential circuits. Explain methods of removal of hazards in sequential circuit design,

b) A circuit has two inputs x, and$x_2$andone output z

When $x_1 = 0$ Output $z=x_2$

When$x_{1=1}$ Output remains unchanged

Develop a primitive flow table

Unit - IV

7.a) Explain the various blocks of ASM flow charts with the help of a suitable example,

b) Explain the hardware implementation and algorithm for the addition and subtraction with signed-2's complement data.

OR

8.a) What is a controller? Describe the autonomous and nonautonomous controllers with state diagram.

b) Draw an ASM chart for a comparator and Explain it.

Unit-V

9.a) What are faults? Also discuss its types.

b) What are programmable logic arrays? Implement the following function with PLA

F = AB'+AC' + A'B'C

OR

10.a) What is FPGA? Describe various types of FPGA with diagram.

b) Implement a BCD to Excess-3 code converter by using PLA.