D 42095 (Pages 2) Name.....

Reg. No.....

# FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2007

Electronics and Communication Engineering

EC/AI/IC 2K 506—DIGITAL SYSTEM DESIGN

Time : Three Hours Maximum : 100 Marks

*Answer* **all** *questions.*

I. (a) State and explain the reason for static hazard in a combinational circuit.

(b) What are control signals and condition signals, explain with example ?

(c) Write the VHDL model for 4 : 1 multiplexer using selected signal assignment statement.

(d) Distinguish between Transport and Inertial Delays.

(e) Draw the simplified block diagram of a PLA.

(f) Discuss about the logic Element (LE) of Flex 10 series CPLDs.

(g) Explain with suitable example fault detection using path sensitization method.

(h) Describe the scan path testing method of sequential circuits.

(8 × 5 = 40 marks)

II. (a) Design a sequential circuit with two D flip-flops A and B and one input $x$. When $x = 0$ the state of the circuit remains same. When $x = 1$, the circuit goes through the state transitions from 00 to 01 and 11 to 10 back to 00 and repeats.

*Or*

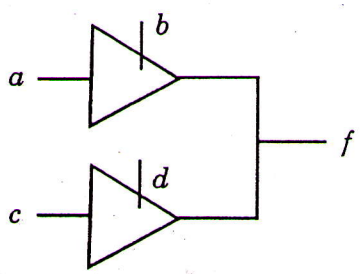
(b) Explain with suitable example hazards in combinational network and sequential network. Also suggest suitable schemes to eliminate them.

(15 marks)

III. (a) With the help of suitable example illustrate the difference between using variables and signals in a process.

*Or*

(b) (i) For the Tristate buffers with active high output enable shown in the following diagram,




write the VHDL code.

(10 marks)

**Turn over**

(ii) Differentiate between Variable assignment and Signal assignment. (5 marks)

IV. (a) Design a parallel adder with accumulator using 22V/10 CMOSPLD (4 bit adder).

*Or*

(b) Draw the simplified block diagram for Xilinx 400 series CLB and Carry logic and explain. (15 marks)

V. (a) Draw the AND-OR network to realize the expression $f = abc + def + ghi$ and obtain the test vector for testing the 9 inputs of the circuit for stuck at – 0 and stuck at – 1 fault.

*Or*

(b) Explain the scan path test procedure with the help of suitable example. (15 marks)

[4 × 15 = 60 marks]