

Code No: 5157G

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech I Semester Examinations, October - 2015

DIGITAL SYSTEM DESIGN
(VLSI System Design/VLSI Design)

Time: 3hrs

Max.Marks:60

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 8 marks and may have a, b, c as sub questions.

PART - A

5 × 4 Marks = 20

- 1.a) Explain about the minimum closed covers. [4]
- b) Explain the need of debouncing and synchronizing circuit in keypad scanner. [4]
- c) What is SM chart? Explain (i) equivalent SM clocks (ii) SM block with feedback. [4]
- d) Explain in detail the types of faults with example. [4]
- e) Explain the rules used for obtaining a distinguishing sequence. [4]

PART - B

5 × 8 Marks = 40

2. Draw the merger graph and obtain the maximum compatibles for the incompletely specified sequential machine. (As shown in figure 1). [8]

PS	NS, z	
	I_1	I_2
A	E, 0	B, 0
B	F, 0	A, 0
C	E, -	C, 0
D	F, 1	D, 0
E	C, 1	C, 0
F	D, -	B, 0

Figure 1

OR

3. Explain the state minimization procedure and apply the procedure for the Machine shown in figure 2 below. [8]

Machine M_1

PS	NS, z	
	$x=0$	$x=1$
A	E, 0	D, 1
B	F, 0	D, 0
C	E, 0	B, 1
D	F, 0	B, 0
E	C, 0	F, 1
F	B, 0	C, 0

Figure 2

4.a) Realize the function using PLA and draw the PLA table.

$$F_0 = \Sigma m(0, 1, 4, 6)$$

$$F_1 = \Sigma m(2, 3, 4, 6, 7)$$

$$F_2 = \Sigma m(0, 1, 2, 6)$$

$$F_3 = \Sigma m(2, 3, 5, 6, 7)$$

b) What is ROM? Discuss the types of ROM. [4+4]

OR

5. Explain the operation of the Add and shift multiplier and draw the state diagram of a multiplier control with counter. [8]

6. How to convert the state graph in to SM chart. Convert the given state graph in to a SM chart. As shown in figure 3. [8]

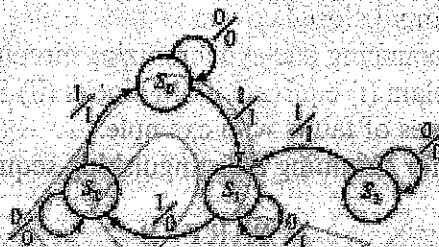


Figure 3

OR

7. Draw and explain the block diagram of a dice game controller and draw the state diagram of it. [8]

8. Find the minimum test set for the network which realizes the function $f = x_1x_2 + x_1x_3x_4 + x_2x_4$ using the kohavi algorithm. [8]

OR

9. What is PODEM? Explain in detail the steps involved in PODEM algorithm. [8]

10. Design a checking experiment for the machine shown in figure 4. [8]

q \ x	0	1
A	B,0	A,1
B	C,0	A,1
C	A,1	B,0

Figure 4

OR

11. Draw the block diagram for fault detection and location in a synchronous sequential machine? Explain. [8]