

II B.Tech I Semester(R07) Supplementary Examinations, May/June 2010

SWITCHING THEORY AND LOGIC DESIGN

(Common to Electrical & Electronic Engineering, Electronics & Instrumentation Engineering, Electronics & Control Engineering and Electronics & Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What is the necessity of binary codes in computers?
(b) Encode the decimal numbers 0 to 9 by means of the following weighted binary codes.
 - i. 8 4 2 1
 - ii. 2 4 2 1
 - iii. 6 4 2 -3
 (c) Determine which of the above codes are self complementing and why? [2+12+2]
2. (a) Find the complement of the following Boolean functions:
 - i. $F = AB' + A'B$
 - ii. $F = (V'W + X)Y + Z'$
 (b) Prove that OR-AND network is equivalent to NOR-NOR network.
(c) Implement the Boolean function $F = A(B + CD) + BC'$ using only NOR gates. [6+4+6]
3. Simplify the following Boolean expressions using K-map and implement them using NOR gates:
 - (a) $F(A, B, C, D) = AB'C' + AC + A'CD'$
 - (b) $F(W, X, Y, Z) = W'X'YZ' + WXY'Z' + W'X'YZ + WXYZ$. [16]
4. (a) Implement Full Adder using decoder and OR gates.
(b) Realize the Boolean function $T(X, Y, Z) = \Sigma(1, 3, 4, 5)$ using logic gates for **hazard free**. [8+8]
5. (a) Derive a PLA programming table for the combinational circuit that squares a 3 bit number.
(b) For a given 3-input, 4-output truth table of a combinations ckt, tabulate the PAL programming table for the ckt.

Inputs			Output			
x	y	z	A	B	C	D
0	0	0	0	1	0	0
0	0	1	1	1	1	1
0	1	0	1	0	1	1
0	1	1	0	1	0	1
1	0	0	1	0	1	0
1	0	1	0	0	0	1
1	1	0	1	1	1	0
1	1	1	0	1	1	1

 [16]
6. (a) Explain various PLD's with their specifications.
(b) Giving excitation table, Explain the operation of JK flip flop. [16]
7. (a) Draw the diagram of mealy type FSM for a serial adder.
(b) Derive the state diagram for an FSM that has an input w and an output z. The machine has to generate z=1, when the previous four values of w were 1001 or 1111 otherwise z=0. Overlapping input patterns are allowed.
An example of the desired behaviour is
w=010111100110011111
z=000000100100010011 [8+8]
8. (a) Explain the symbols used in an ASM chart with neat diagrams.
(b) What are the salient features of the ASM chart? [8+8]
