TUTORIAL 4 (Chapter 3)

SECTION A

MULTIPLE CHOICE QUESTIONS

A1. The Moore's output of a finite state machine depends on _____.

(a) the present state only
(b) the next state only
(c) the present state and primary input
(d) the next state and primary input

Ans( )

A2. A finite state machine has 6 states. Using simple binary state assignment system, how many flip flops are required?

(a) 3
(b) 4
(c) 5
(d) 6

Ans( )

A3. Which of the following shows a Mealy's output Z, given that K and L are the external inputs to a finite state machine while Q_1 and Q_2 are the flip-flop outputs?

(a) $Z=Q_1(K+L)$
(b) $Z=Q_1 + Q_2$
(c) $Z= Q_1 Q_2$
(d) $Z=Q_1(Q_1 + Q_2)$

Ans( )

SECTION B

B1. A finite state machine has an input w and an output z. The machine is a sequence detector that produces z = 1 when the previous two values of w were 00 or 11; otherwise z = 0.

(a) Draw the Moore's state diagram.
(b) Derive the state table from part (a).

B2. Figure 1 shows the excitation table for an FSM. The FSM has an input P, and two output Y and Z. Both flip-flops response to a PGT clock signal.

Present state		Input	Output		Next state		Excitation	
Q_A	Q_B	P	Y	Z	Q_A	Q_B	D_A	D_B
0	0	0	0	0	0	0	0	0
		1	0	0	1	1	1	1
0	1	0	0	1	0	1	0	1
		1	0	0	1	1	1	1
1	0	0	0	1	0	0	0	0
		1	0	0	1	1	1	1
1	1	0	1	1	0	1	0	1
		1	1	0	1	1	1	1

Figure 1

(a) Derive the minimized Boolean equations for Y, Z, D_A and D_B.
(b) Draw the schematic diagram for the FSM using the *minimum number of logic gates*.