

EE2000 Assignment 2 (Total 50 marks)

- Q1. Reduce the number of states in the following state table by complication table method and tabulate the reduced state table. (15 marks)

Present state	Input x	Next state	Output y
a	0	f	0
a	1	b	0
b	0	d	0
b	1	c	0
c	0	f	0
c	1	e	0
d	0	g	1
d	1	a	0
e	0	d	0
e	1	c	0
f	0	f	1
f	1	b	1
g	0	g	0
g	1	h	1
h	0	g	1
h	1	a	0

- Q2. A sequential circuit has one flip-flop, Q ; two inputs, x and y ; and one output, S . It consists of a full-adder circuit connected to a D flip-flop, as shown in Figure 2. Derive the state table and state diagram of the sequential circuit. (15 marks)

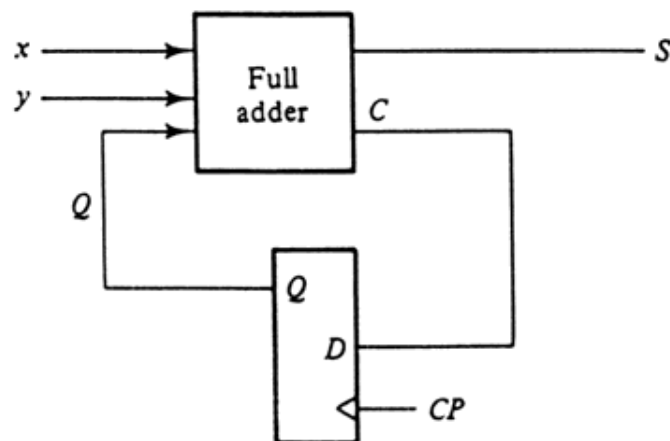


Figure 2.

- Q3. A coke vending machine is to be designed. A can of coke is selling at \$3. The machine takes only \$2 and \$1 coins. Each time only one coin is allowed to be deposited into the machine. If the deposits are less than \$3, the machine will not produce anything. If there are deposits of a total of \$3, the machine will automatically produce a drink with no change. If there are deposits of a total of \$4, the machine will produce a drink together with a \$1 change. If the cancel button is pressed, the machine will release no drink with the deposited amount return.

Design the coke vending machine using Mealy model with JK flip-flops and minimum number of states. (Give the answer with state diagram, stable table, excitation table only).

Inputs $X_1 X_0$	Meaning
0 0	No Action
0 1	Insert a \$1 coin
1 0	Insert a \$2 coin
1 1	Press the cancel button

(20 Marks)

Date of submission: Week 12, lecture time.

Please note that late submission without valid reason will not be accepted.

END