

Name: Answer

Instructions: Answer all questions. Do NOT use any notes, book or calculator and show all work using back of page if necessary. Clearly indicate the final answer on the front of the page.

1. Analyze the clocked synchronous state machine in the figure below and write the excitation and output equations, excitation/transition table, and state/output table using state names A - D for Q1 Q2 = [00, 01, 10, 11], i.e., binary state encoding. Use Q1 Q2 order for tables. Is this a Mealy or Moore state machine? Draw the state diagram.

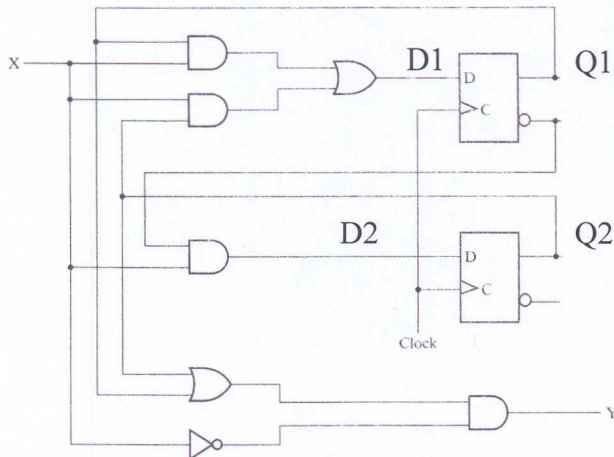


Figure 1: FSM with input X and output Y

$$D1 = Q1 \cdot X + Q2 \cdot X = Q1^*$$

$$D2 = Q1' \cdot X = Q2^*$$

$$Y = (Q2 + Q1) \cdot X'$$

Mealy

Excitation/Transition Table

PS		NS	
Q1	Q2	x=0	x=1
0	0	0 0	0 1
0	1	0 0	1 1
1	0	0 0	1 0
1	1	0 0	1 0

State/Output Table

S	NS		Y	
	x=0	x=1	x=0	x=1
A	A	B	0	0
B	A	D	1	0
C	A	C	1	0
D	A	C	1	0

state Diagram

