

# Solutions - Quiz 4

(November 22<sup>nd</sup> @ 5:30 pm)

## PROBLEM 1 (35 PTS)

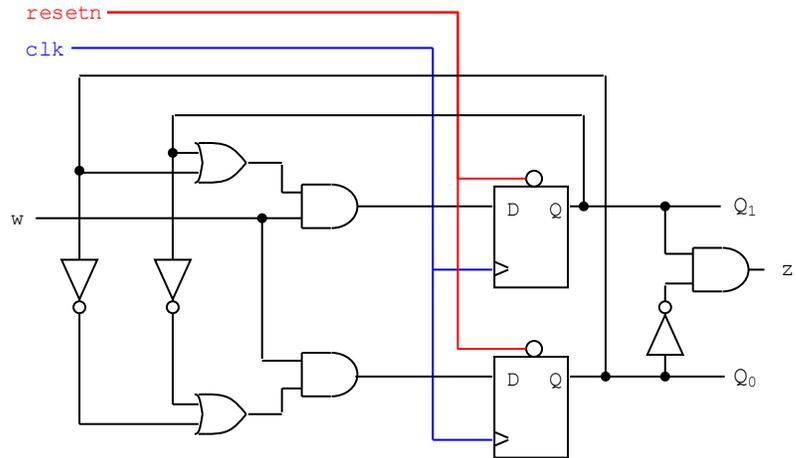
- Provide the Excitation equations (including the Boolean equation for z) and the Excitation Table of the following FSM:

$$Q_1(t+1) \leftarrow (Q_1(t) + Q_0(t))w$$

$$Q_0(t+1) \leftarrow Q_1(t)Q_0(t)w$$

$$z = Q_1(t)Q_0(t)$$

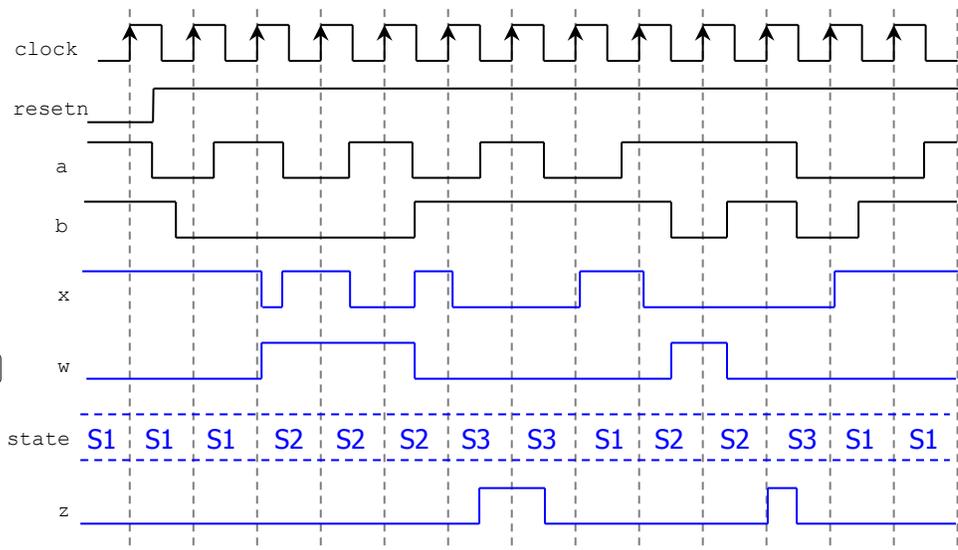
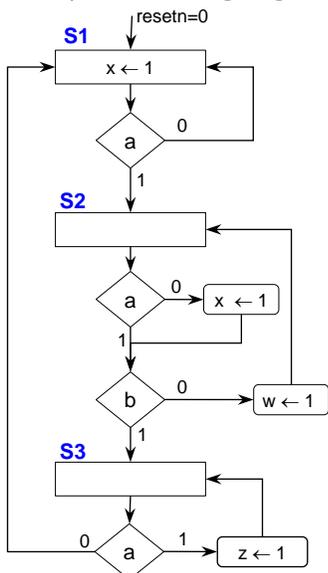
PRESENT STATE			NEXTSTATE	
w	Q <sub>1</sub> Q <sub>0</sub> (t)		Q <sub>1</sub> Q <sub>0</sub> (t+1)	z
0	0	0	0 0	0
0	0	1	0 0	0
0	1	0	0 0	1
0	1	1	0 0	0
1	0	0	0 1	0
1	0	1	1 1	0
1	1	0	1 1	1
1	1	1	1 0	0



- Which type is this FSM? Circle or mark the correct one: (Mealy) ~~(Moore)~~

## PROBLEM 2 (35 PTS)

- Complete the timing diagram of the following FSM (represented in ASM form):



PROBLEM 3 (30 PTS)

- Sequence detector: Draw the state diagram (any representation) of an FSM with input  $x$  and output  $z$ . The detector asserts  $z = 1$  when the sequence 0110 is detected. Right after the sequence is detected, the circuit looks for a new sequence.

