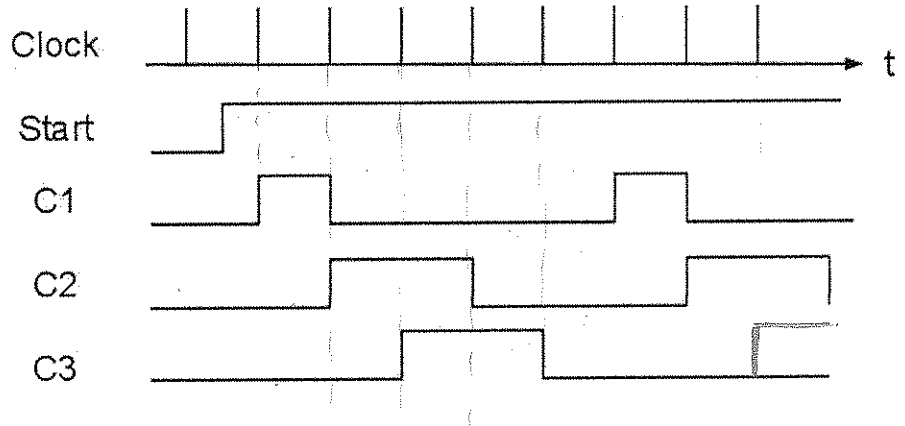
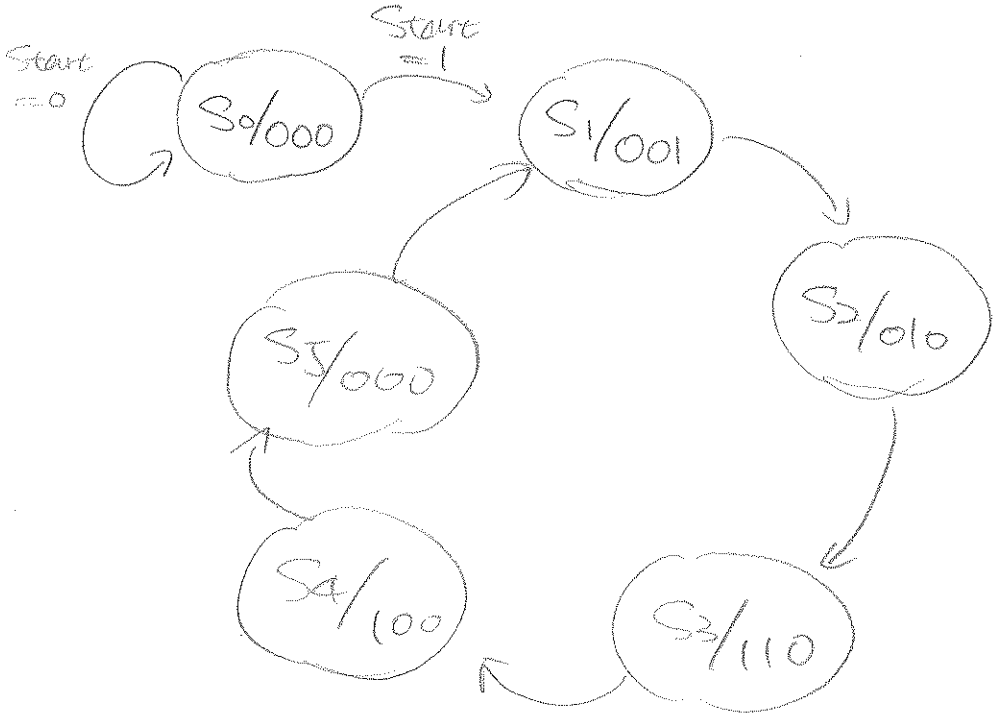
UCLA
Department of Electrical Engineering
EEM16 – Fall 2010
Quiz 2 (15 minutes) Solution (Wed)
Nov 17, 2010

Problem 1

Show a state diagram description of a controller with timing diagram presented below. The inputs of the controller are Clock and Start, and the outputs are C1, C2 and C3.





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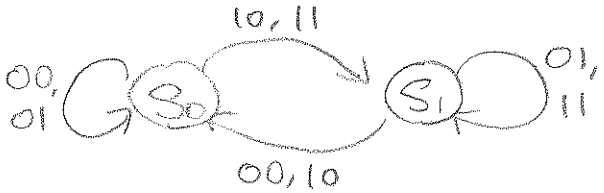
Quiz 2 Solution (Fri)
(This quiz contains 1 problem)

1. PN Flip-flop:

PS = Q(t)	P(t)N(t)			
	00	01	10	11
0	0	0	1	1
1	0	1	0	1
	NS = Q(t+1)			

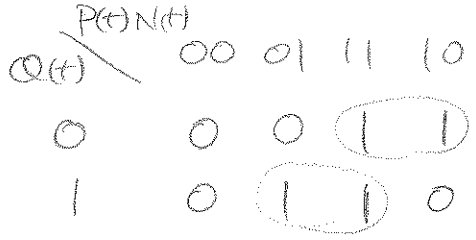
(1) Show the state diagram of PN flip-flop



(2) Show the excitation function E(Q(t), Q(t+1)) by filling the table below:

PS = Q(t)	NS = Q(t+1)	
	0	1
0	0 –	1 –
1	– 0	– 1
	P(t)N(t)	

(3) Derive the state transition function (the characteristic expression of Q(t+1))



$$Q(t+1) = Q'(t)P(t) + Q(t)N(t)$$