CSCE 211 CHAPTER 6 HOMEWORK DUE: NOV 17TH 2022

You must show all your work! Answers without supporting work will not be given credit.

All problems are inspired by our *Introduction to Logic Design* 3rd *Edition* text.

Only neatly hand-written or typed work will be accepted.

Homework must be in PDF format and should be scanned using, at minimum, a phone camera scanning app.

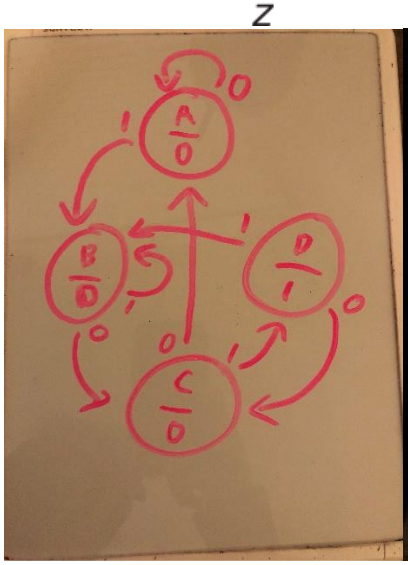
This homework is worth 5 points.

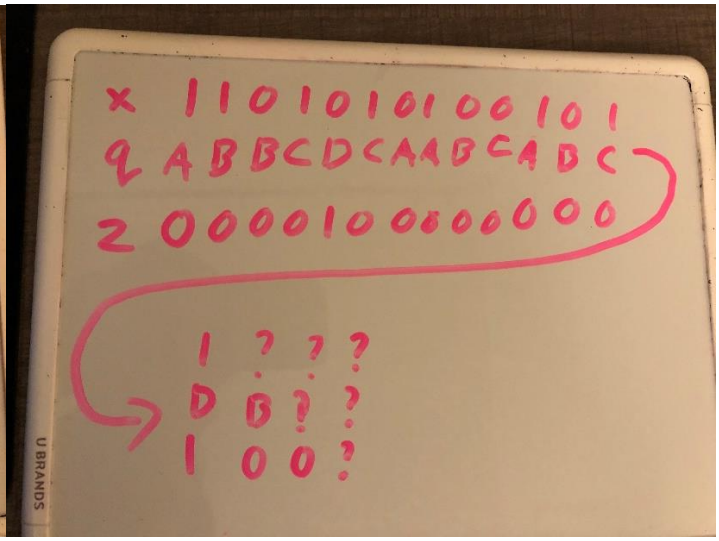
Name: Damian Sclafani

1. Draw both the state diagram and complete the timing sequence as x changes until you have no distinct state information remaining.

q	q^* $x=0$	$x=1$	z
A	A	B	0
B	C	B	0
C	A	D	0
D	C	B	1

x	1	1	0	1	0	1	0	1	0	0	1	0	1	1	
q	A														
z															

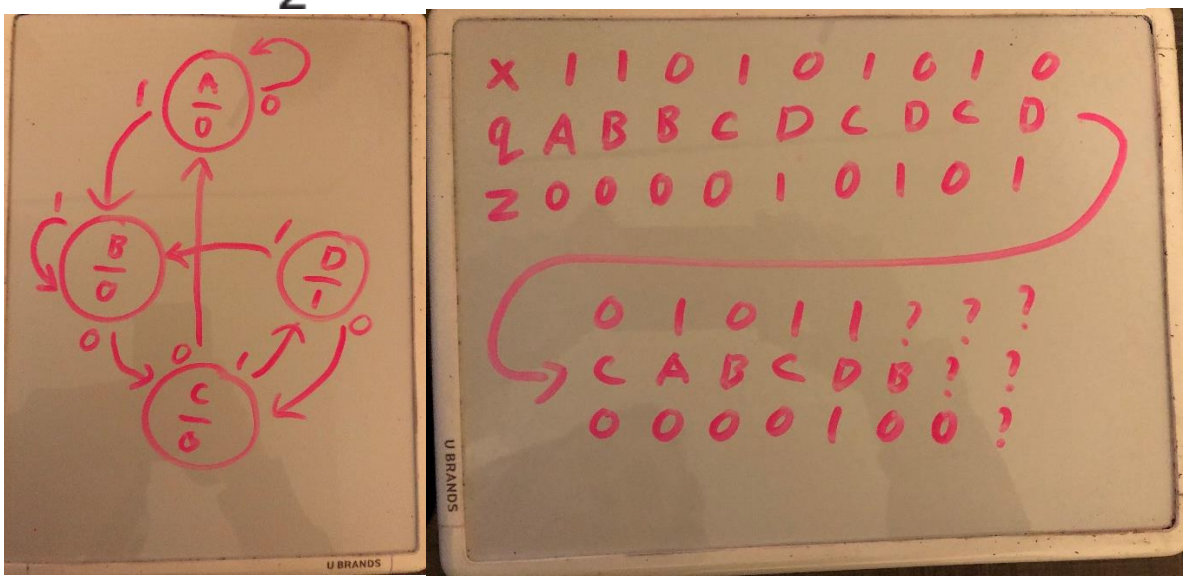




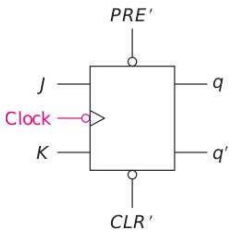
2. Draw both the state diagram and complete the timing sequence as x changes until you have no distinct state information remaining.

q	q^+ $x=0$	$x=1$	z
A	A	B	0
B	C	B	0
C	A	D	0
D	C	B	1

x	1	1	0	1	0	1	0	1	0	0	1	0	1	1
q	A													
z														



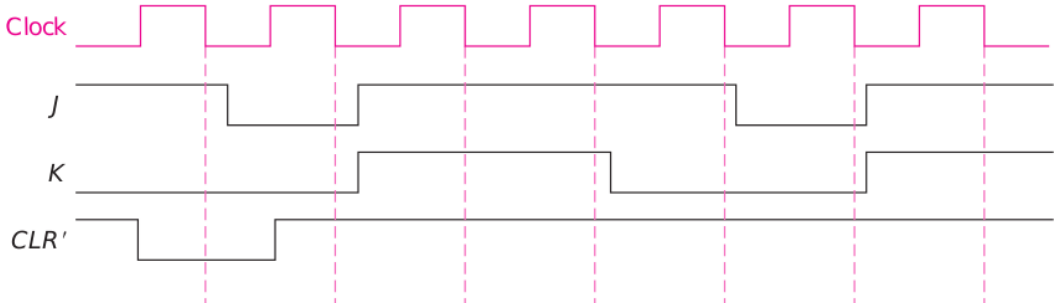
3. Given the following JK flip-flop,

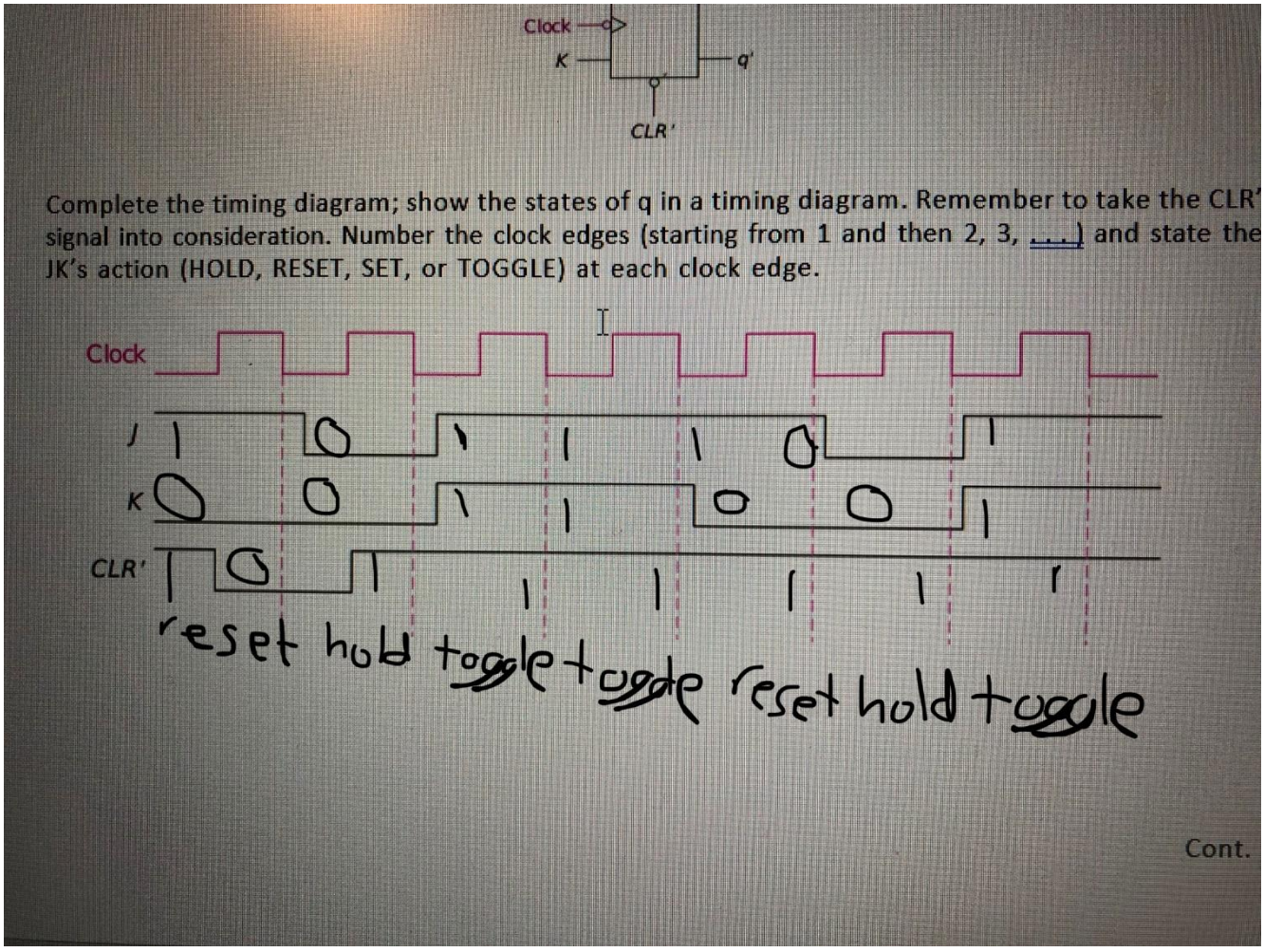


Complete the timing diagram; show the states of q in a timing diagram. Remember to take the CLR' signal into consideration. Number the clock edges (starting from 1 and then 2, 3, . . .) and state the

Cont.

JK's action (HOLD, RESET, SET, or TOGGLE) at each clock edge.





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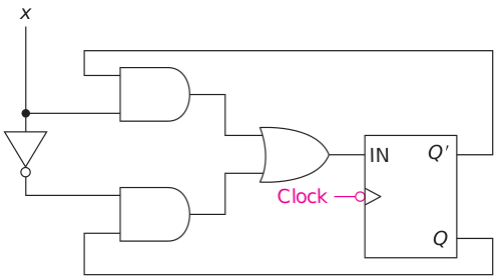
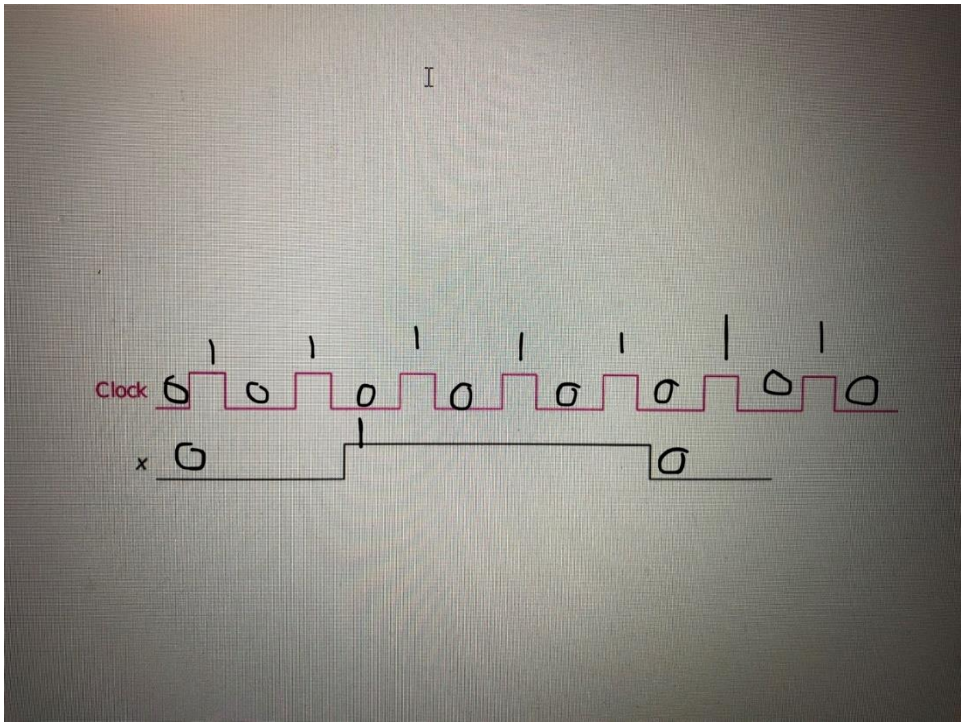
4. Given the following sequential circuit,



Treat IN as the D-input to D flip-flop. Show the necessary state table (for states 0 and 1) and complete the following timing trace as long as the clock allows. Assume Q begins storing 0.

D	q	q*
0	0	0
0	1	0
1	0	1
1	1	1



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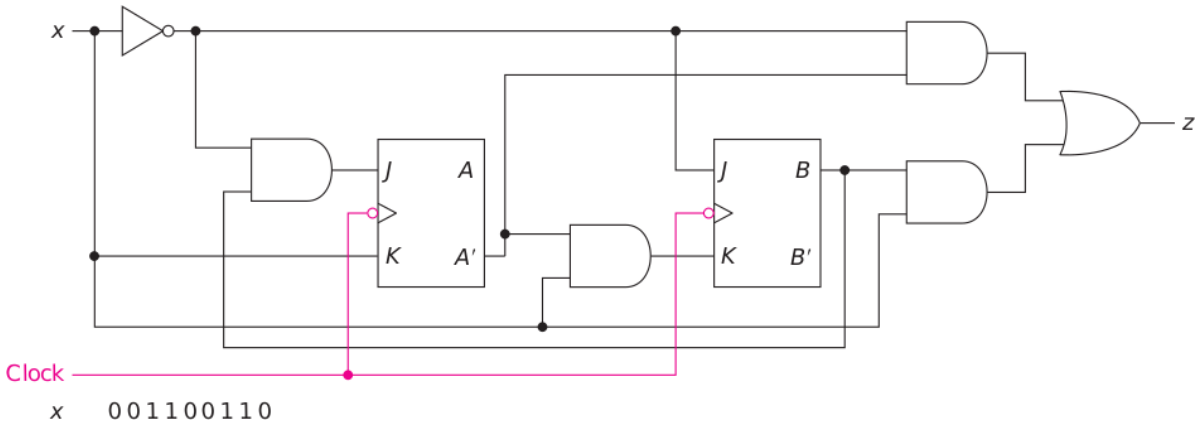
5. Given the following sequential circuit,



(a) Provide equations for A^* and B^*,

(b) Create a state table (Moore or Mealy) with states [00—11], and

(c) Assuming AB starts in 00, complete the timing trace until no state information remains.

JA = x'B

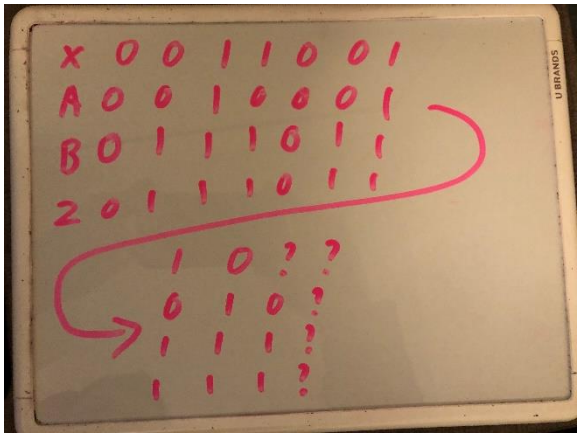
KA = x

JB = x'

KB = xA'

Z = x'A' + Bx

A	B	X = 0	X = 1	z
0	0	0 1	0 0	0
0	1	1 1	0 0	1
1	0	0 0	0 1	1
1	1	0 1	0 1	1



The End.