ELEG 2134: Digital Logic Design Quiz 11 2009.04.17

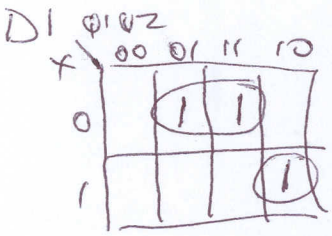
Name: Answer

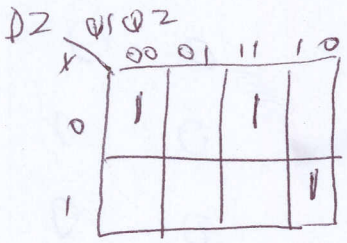
Instructions: Answer all questions. Do NOT use any notes, book or calculator and show all work using back of page if necessary. Clearly indicate the final answer on the front of the page.

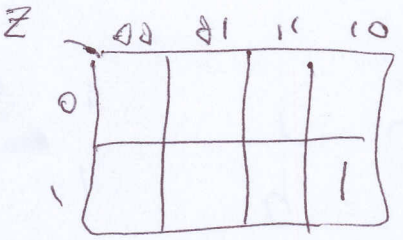
1. Given the State/Output Table below with input, x, and output, z, find the excitation equations for the D flip-flops and output equation to synthesis the circuit. Use the following state assignments: A=00; B=01; C=11; D=10. Use Q1 Q2 order for the transition table. Is this a Moore or Mealy FSM? Draw the state diagram. It is not necessary to draw the circuit.

Current State	*Next State / z*	
	x = 0	***x = 1***
A	B / 0	A / 0
B	D / 0	A / 0
C	C / 0	A / 0
D	A / 0	C / 1

Q1	Q2	x=0		x=1	
0	0	0	1	0	0
0	1	1	0	0	0
1	1	1	1	0	0
1	0	0	0	1	1







$D1 = Q2 \cdot x' + Q1 \cdot Q2' \cdot x$

$D2 = Q1' \cdot Q2' \cdot x' + Q1 \cdot Q2 \cdot x' + Q1 \cdot Q2' \cdot x = (Q1 \oplus Q2) \cdot x' + Q1 \cdot Q2' \cdot x$

$z = Q1 \cdot Q2' \cdot x$ Mealy