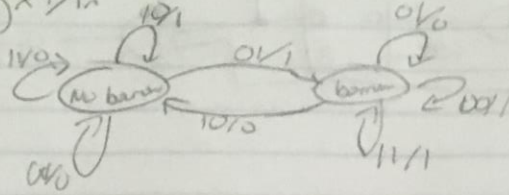


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CSE 140 HW. 5
1) a) X, Y in



b)

Input		State	Next State	Output
X	Y	Z	Z+1	O
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	1	0
1	0	0	0	1
1	0	1	0	0
1	1	0	0	0
1	1	1	1	1

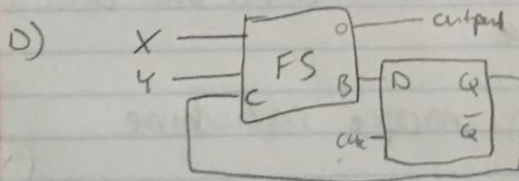
c) Next: $XZ' + Y'Z + XY'$
 Out: $X'Y'Z + XY'Z' + XYZ + X'YZ'$

Truth Table for Next State:

Z	X	Y	Z+1
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

Truth Table for Output:

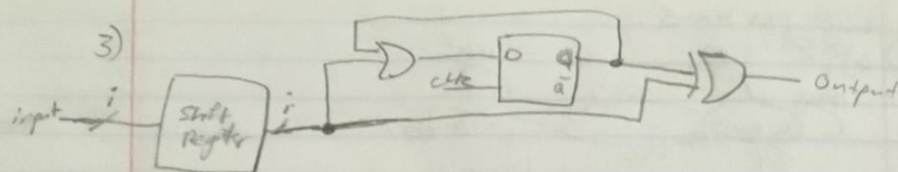
Z	X	Y	Out
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1



and 2
not 10
not 15
now 30

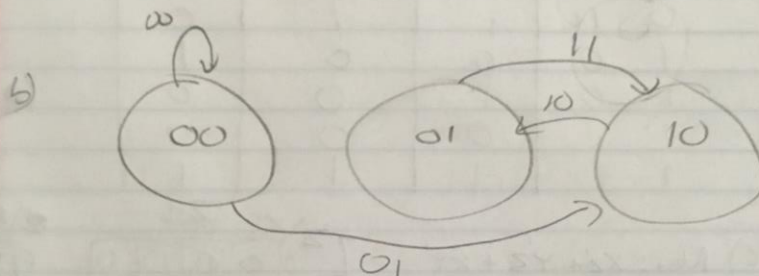
2) Max Clock Freq. $2(35)ps + 60ps + 10 + 15 + 30 + 20 = 255ps = T$
 $f = 4.88 \text{ GHz}$

b) $15 + 60 = 75ps$
 $t_{cd} > t_{hd} + t_{shw} - t_{cc}$
 $T_{cd} + T_{ccq} - T_{hold} > t_{shw}$
 $75ps + 30ps - 20ps > t_{shw}$ (85ps)



4) a)

Y	Z	Out-1	Out-2
0	0	0	0
0	1	1	0
1	0	0	1
1	1	1	0



c) Switch output between Out-1 and Out-2 every cycle

d) This is a Moore machine