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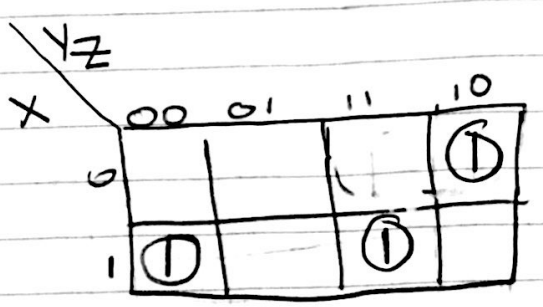
Nov 13, 2017
Digital Logic Design
Homework

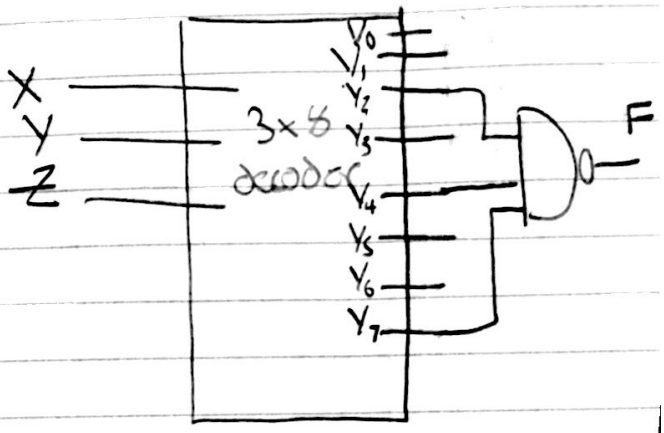
Hw7:

6.20)

a) $F = \sum XYZ(2,4,7)$

$F = \bar{X}Y\bar{Z} + X\bar{Y}\bar{Z} + XYZ$

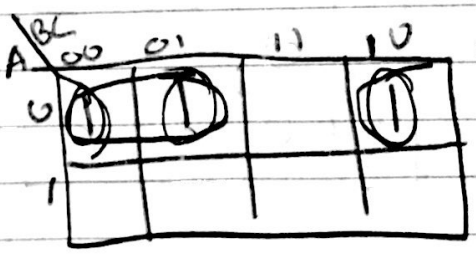


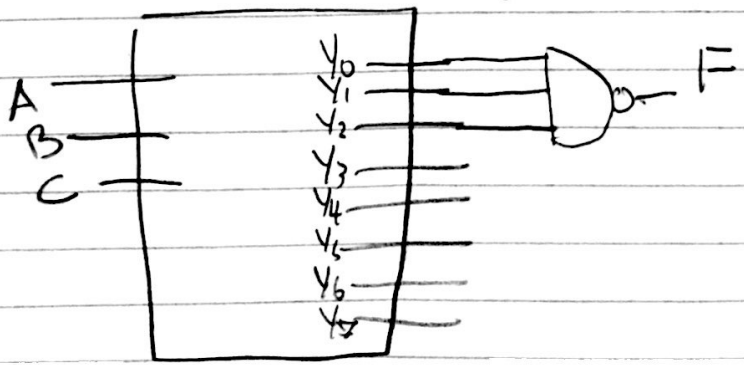


b) $F = \Pi_{ABC}(3,4,5,6,7)$

$F = \sum_{ABC}(0,1,2)$

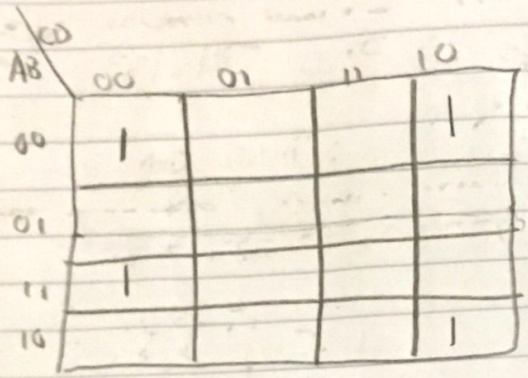
$F = \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}C + \bar{A}B\bar{C}$

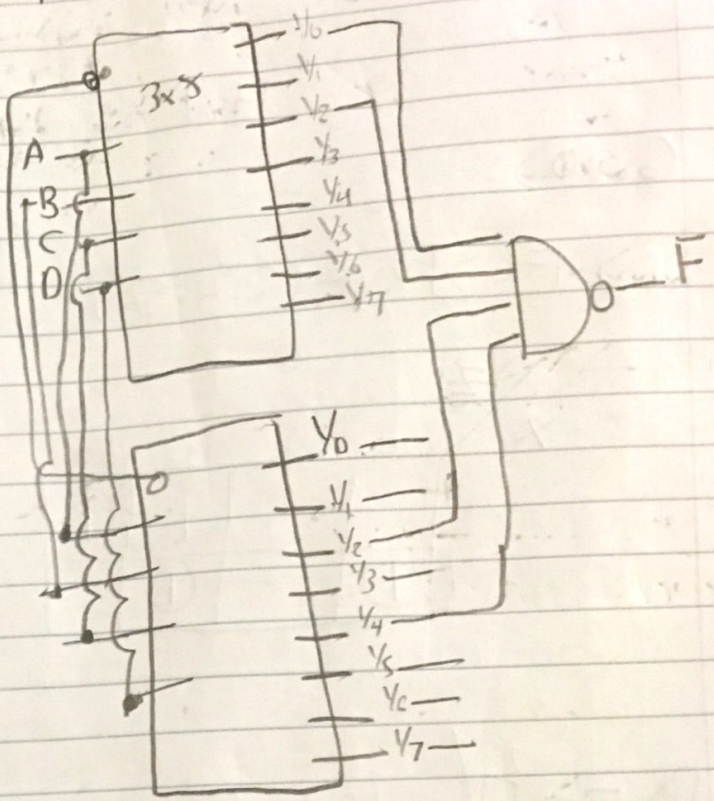




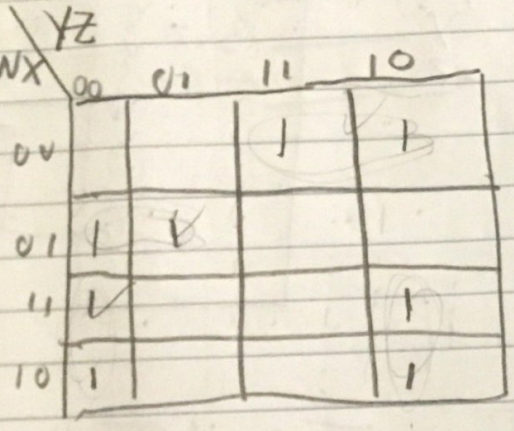
c) $F = \sum_{ABCD}(0,2,10,12)$

$F = \overline{ABCD} + \overline{AB}C\overline{D} + A\overline{B}C\overline{D} + A\overline{B}\overline{C}\overline{D}$

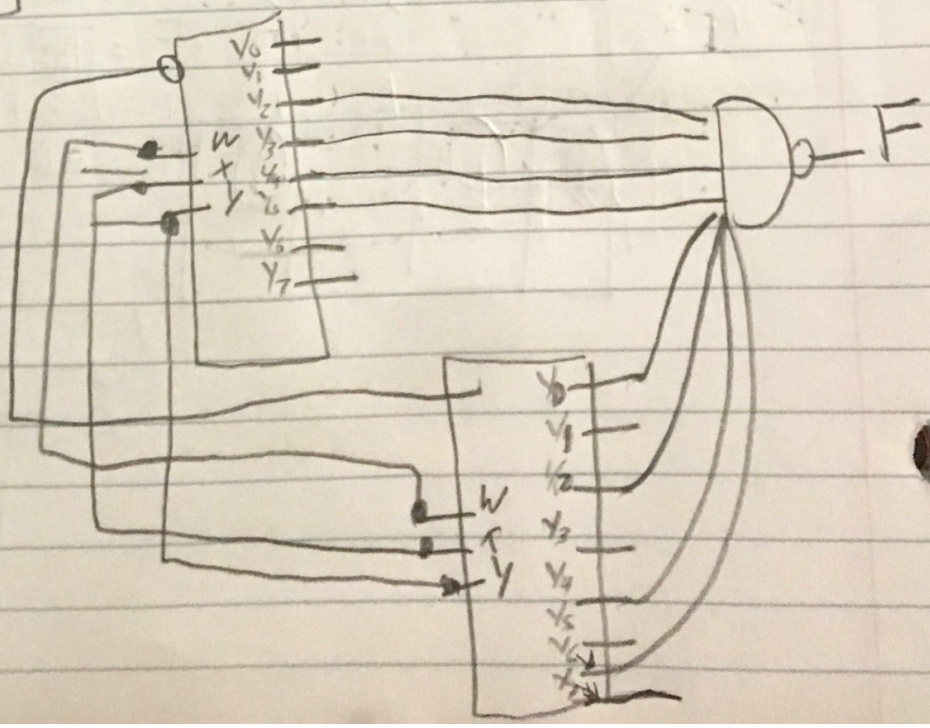




d)



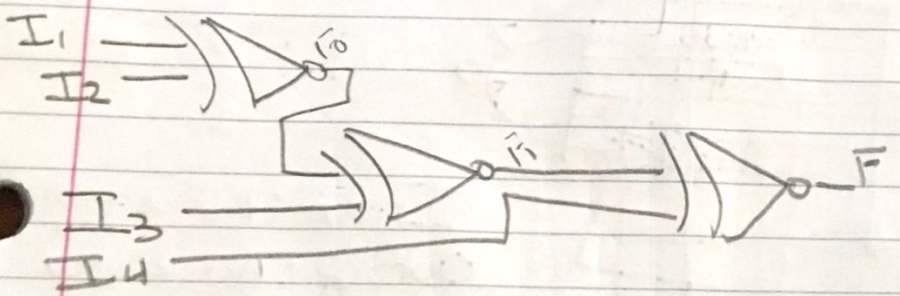
$F = WX\bar{Y} + \bar{W}X\bar{Y} + W\bar{Y}\bar{Z} + WY\bar{Z}$



6.21:

- The circuit is wrong because if you look closely you can see that both halves of the 74x139 are enabled @ the same time.
- This problem can be solved by putting an inverter on the signal going 1G to 2G, which ensures that only one sources drives SDATA @ all times!

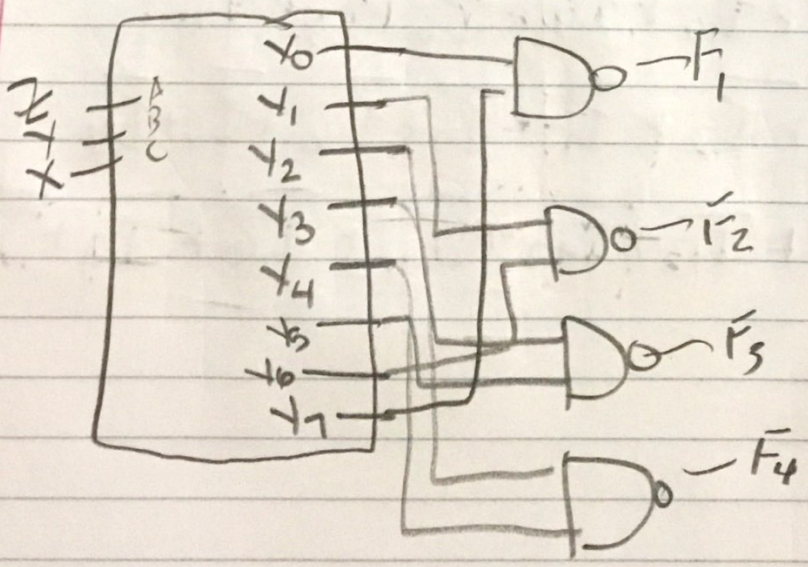
6.24:



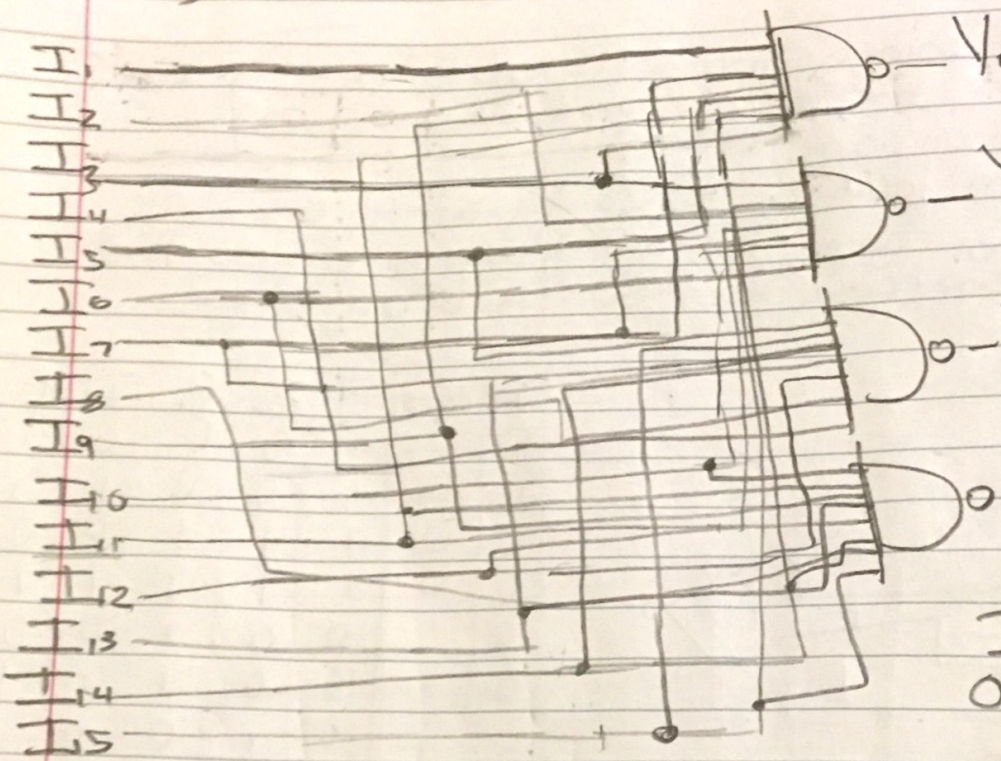
I_1	I_2	F_0	I_3	F_1	I_4	F
0	0	1	0	0	0	1
0	0	1	0	0	1	0
0	0	1	1	1	0	0
0	0	1	1	1	1	1
0	1	0	0	1	0	0
0	1	0	0	1	1	1
0	1	0	1	0	0	1
0	1	0	1	0	1	0
1	0	0	0	1	0	0
1	0	0	0	1	1	1
1	0	0	1	0	0	1
1	0	0	1	0	1	0
1	1	1	0	0	0	1
1	1	1	0	0	1	0
1	1	1	1	1	0	0
1	1	1	1	1	1	1

This is an even parity

6.43)



6:51)



Input : Active High
Output : Active low

$$Y_0 = \overline{I_{15}} + \overline{I_{13}} + \overline{I_{11}} + \overline{I_9} + \overline{I_7} + \overline{I_5} + \overline{I_3} + \overline{I_1}$$

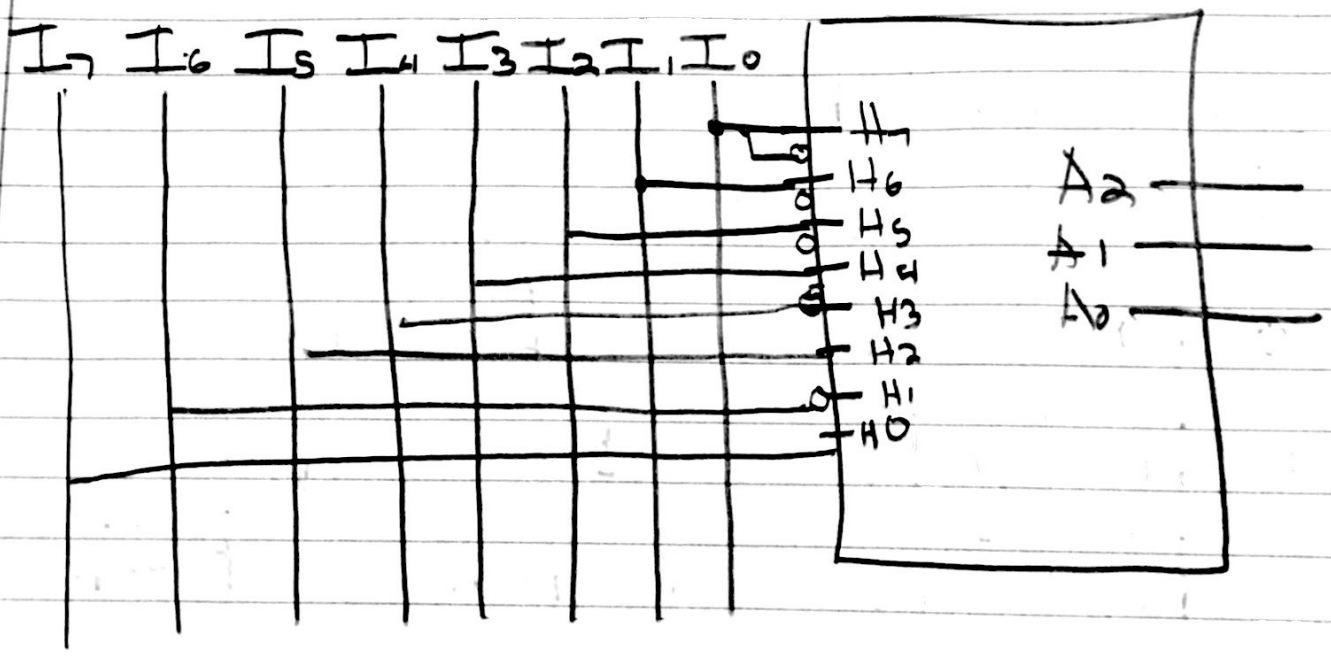
$$Y_1 = \overline{I_{15}} + \overline{I_{14}} + \overline{I_{11}} + \overline{I_{10}} + \overline{I_7} + \overline{I_6} + \overline{I_3} + \overline{I_2}$$

$$Y_2 = \overline{I_{15}} + \overline{I_{14}} + \overline{I_{13}} + \overline{I_{12}} + \overline{I_7} + \overline{I_6} + \overline{I_5} + \overline{I_4}$$

$$Y_3 = \overline{I_{15}} + \overline{I_{14}} + \overline{I_{13}} + \overline{I_{12}} + \overline{I_{11}} + \overline{I_{10}} + \overline{I_9} + \overline{I_{8}}$$

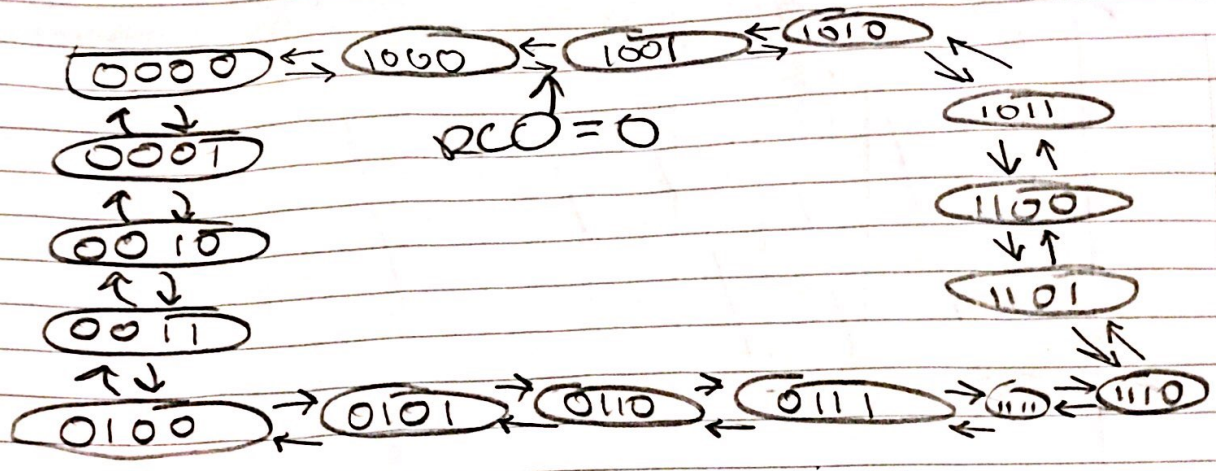
8.3)

								Outputs			
I_7	I_6	I_5	I_4	I_3	I_2	I_1	I_0	A_2	A_1	A_0	Valid
1								0	0	0	1
	1							0	0	1	1
		1						0	1	0	1
			1					0	1	1	1
				1				1	0	0	1
					1			1	0	1	1
						1		1	1	0	1
							1	1	1	1	0



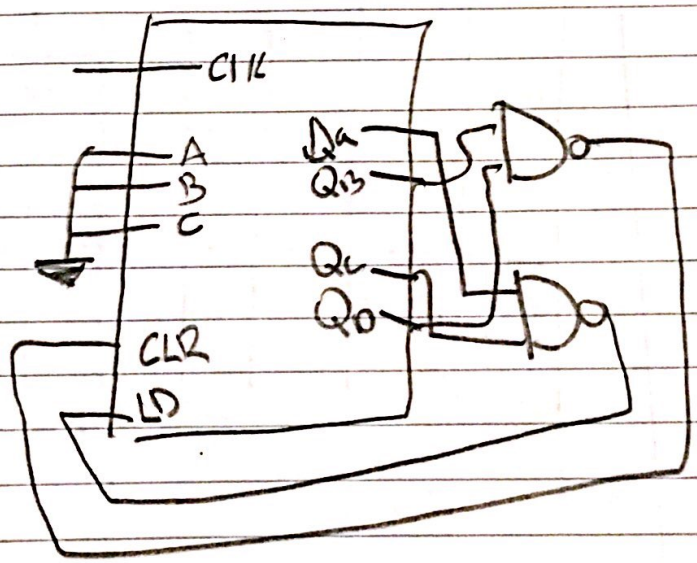
Chapter 8:

13)

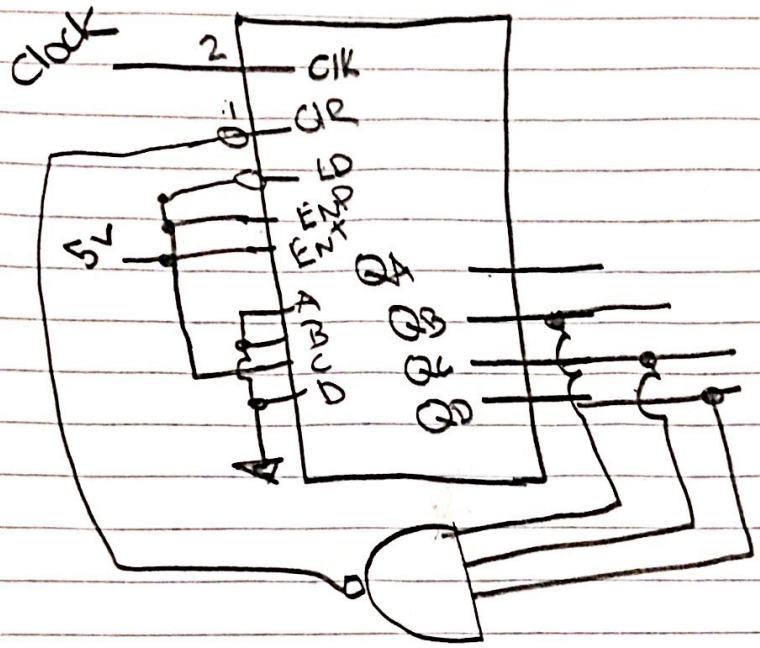


14)

QD	QC	QB	QA
0	0	0	0
0	0	0	1
0	0	1	0
0	0	1	1
0	1	0	0
0	1	0	1
1	0	0	0
1	0	0	1
1	0	1	0
0	0	0	0
0	0	0	1
0	0	1	0
0	0	1	1
0	1	0	0
0	1	0	1



35)



35)