

# Pre-Lab Worksheet #2 NAME: LillAnne's Answers LAB Section: B0

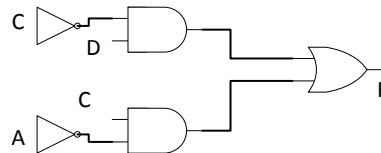
1. The SOP of :  $F(A,B,C,D) = \sum m(1,2,3,5,6,9) + \sum d(7,10,11,12,13)$

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

AB\CD

	00	01	11	10
00		1	1	1
01		1	x	1
11	x	x		
10		1	x	x

2. The circuit that represents the SOP of  $F(A,B,C,D)$  using OR gates, AND gates and inverters (on main inputs).



3. The POS of :  $F(A,B,C,D) = \sum m(1,2,3,5,6,9) + \sum d(7,10,11,12,13)$

$$\bar{F} = \bar{C}\bar{D} + AC$$

$$\text{Thus, } F = (C + D)(\bar{A} + \bar{C})$$

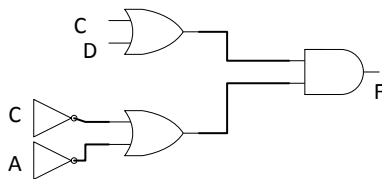
$$\text{Alternately: } \bar{F} = \bar{C}\bar{D} + AB$$

$$\text{Thus, } F = (C + D)(\bar{A} + \bar{B})$$

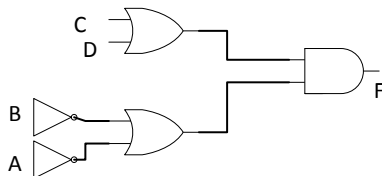
AB\CD

	00	01	11	10
00	0			
01	0		x	
11	x	x	0	0
10	0		x	x

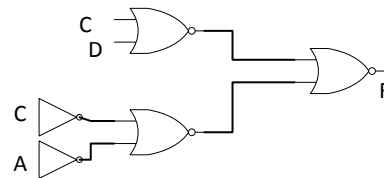
4. Draw the POS form of the circuit using OR and AND gates (plus inverters on the main inputs.)



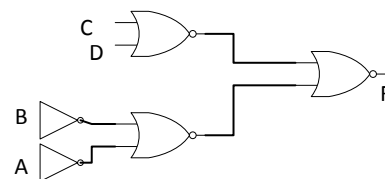
or



5. Re-draw the circuit using only 2-input NOR gates (plus inverters on the main inputs.) Include pin numbers.



or



Either circuit use 5 gates: 3 NOR, 2 inverters.

6. Karnaugh maps and simplified functions  $X$ ,  $Y$ , and  $Z$

A\BC

	00	01	11	10
0		1	1	
1		1	1	

$X = C$

A\BC

	00	01	11	10
0			1	1
1			1	1

$Y = B$

A\BC

	00	01	11	10
0				
1	1	1	1	1

$Z = A$

7. Draw circuits for  $X$ ,  $Y$ , and  $Z$  using only 2-input NAND gates and Inverters on the inputs. Include chips pin numbers on all inputs and outputs.

Note: The assigned code is *\*not\** a Gray code, as it claimed to be!!

$C - X$

$B - Y$

$A - Z$

Finally, write a list of things that you learned in doing this pre-lab:

- Karnaugh Maps
- Don't Care States
- How to change and/or circuits to either NAND or NOR circuits.