

Homework #5

Number Systems, Boolean Algebra and Logic Gates

Due: Tuesday, 13 April (Can be turned in the studio during open shop times or by 5 PM at Prof. Connor's Office, JEC 6002) The solution will be posted on 14 April.

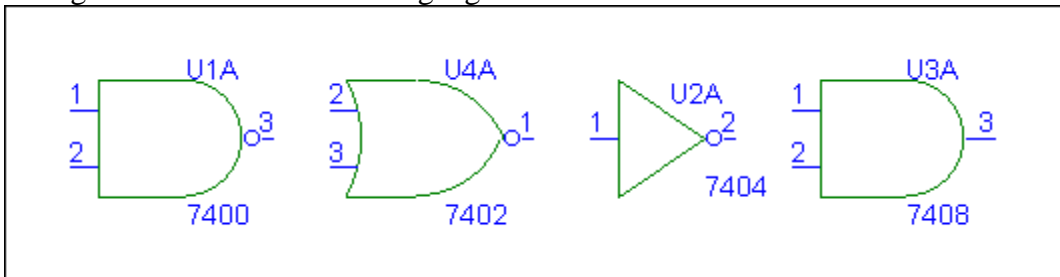
1. Number Systems: Convert the decimal numbers to binary and vice-versa (do not look them up in the table.):

Binary	Decimal
0101	
1101	
	6
	15

2. Boolean Algebra: Determine which boolean operation is represented by the following table:

B	A	Result
0	0	0
0	1	1
1	0	1
1	1	1

3. Logic Gates: Write kind of logic gate is each of these devices?:



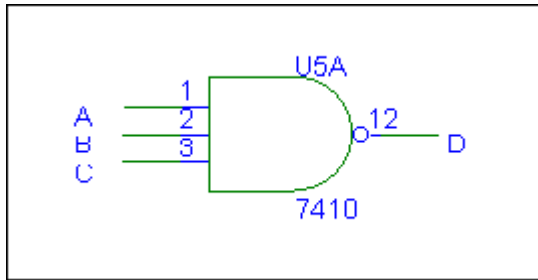
4. Boolean Algebra: Simplify the expression below.

$$D = (C + 0) \cdot (A + (\overline{A \cdot B}))$$

5. Combinational Logic: Draw a logic circuit that performs the following function.

$$D = A \cdot (C + (B \cdot A))$$

6. Fill in the truth table for the circuit below.



C	B	A	D
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

Some reference materials:

<http://www.ied.edu.hk/has/phys/de/de-ba.htm>

<http://www.dgp.utoronto.ca/people/van/courses/csc258/bool.html>