Test #2 (Nov 20, 2014)

- Text: Dale and Lewis Ch. 4 (4.1-4.6) and Ch. 5 (5.1, 5.2, 5.4)
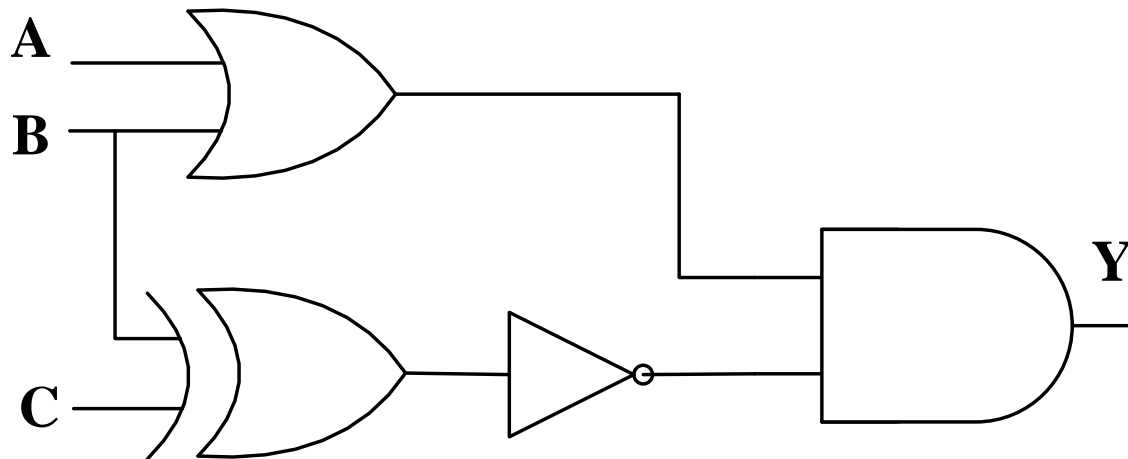
- Glade Manual: Ch. 3, 4, 5 and 6

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- <u>Sample question #1:</u>

a) Draw the circuit diagram of the following Boolean expression:

$$Y = (A + B) \bullet \overline{(B \oplus C)}$$

Solutions:

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- Sample question #1:

$$Y = (A + B) \bullet \overline{(B \oplus C)}$$

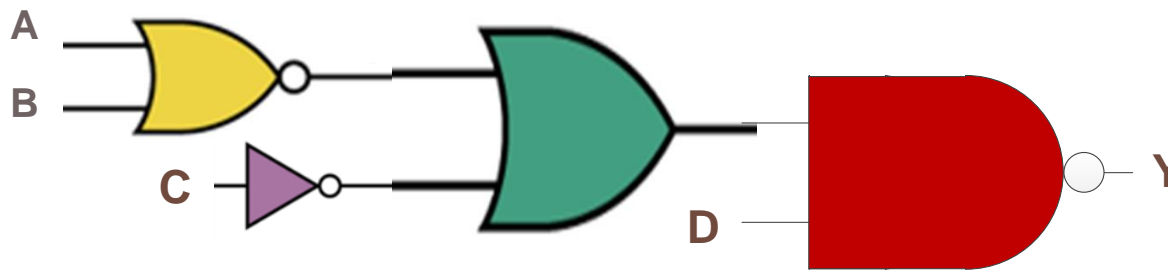b) Give the truth table for the above expression

Solutions:

OR gate

A	B	X
0	0	0
0	1	1
1	0	1
1	1	1

Inversion of XOR gate

B	C	W
0	0	1
0	1	0
1	0	0
1	1	1

A	B	C	X	W	Y
0	0	0	0	1	0
0	0	1	0	0	0
0	1	0	1	0	0
0	1	1	1	1	1
1	0	0	1	1	1
1	0	1	1	0	0
1	1	0	1	0	0
1	1	1	1	1	1

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CSE 1520 -- Computer Use: Fundamentals

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- ## Sample question #2:

Give the Boolean expression for the following circuit with output "Y":
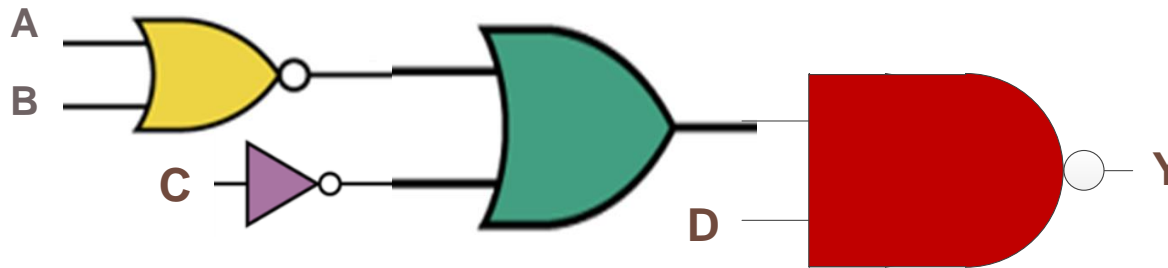

Solutions:

Start from the left, the first gate is an NOR gate between A and B, then we have an OR gate between the output of the NOR gate and the inversion of C. The last operation is the NAND operation between D and the output of the OR gate

$$Y = \overline{\left(\overline{(A+B)}+\overline{C}\right) \bullet D}$$

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- Sample question #2:

How many transistors are required to implement the following circuit?

Solutions:

1 for the NOT gate,
2 for the NOR gate,
2 for the NAND gate,
3 for the OR gate (i.e. OR gate = Inversion of NOR gate, so 2 + 1 = 3)

Total = 8 transistors

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- <u>Sample question #3:</u>

Given the following table in Excel:

	A	B	C	D	E	F
1						
2						
3						
4			**Name**	**Marks**	**Derivation from Average**	
5			Peter	90		
6			Jane	88		
7			Mary			
8			Tommy	76		
9			Sam			
10			Jessica	92		
11						
12			**Average**	86.5		
13						

Complete the cells (E5 to E10) if the following function is used in those cells:

=IF(ISNUMBER(Marks),Marks-Average,"")

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Solutions:

The Excel function evaluates each cell from E5 to E10 and checks if the range of cell defined by "Marks" is a number.

If it is true, then proceed and calculate "Marks – Average"
If it is false, then return empty space for that cell

So, E5 to E10 will be:

$$E5 = 3.5$$
$$E6 = 1.5$$
E7 is empty space
$$E8 = -10.5$$
E9 is empty space
$$E10 = 5.5$$

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