Homework 2 – Logic Gates and Waveforms

Student's Name: _____

Instructions:

- You have to show all work in order to receive full credit

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1. A owner of a house wants to design a lamp that works with the following specifications:

- A lamp in a room is operated from two switches, one at the *front* and one at the *back* of the room.
- The lamp is to be ON if both of the switches are ON.
- The lamp is to be OFF if one of the switches is OFF.

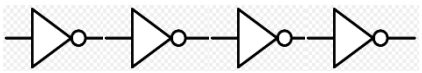
According to the description, the best logic gate to perform the operation is (6 pts): _____

2. The number of output combinations for a 6-input logic gate is (6 pts):

_____

_____

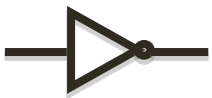
3. If four NOT gates are connected in series and the input to the first gate is a **HIGH** (1), the output of the fourth gate will be (6 pts): _____



4. What is the truth table for an **NAND** gate is (6 pts):

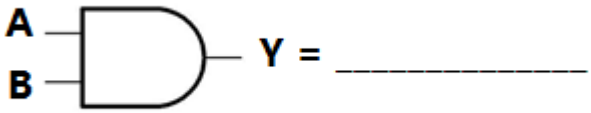
Truth Table 2-input NAND gate		
Inputs		**Output**
A	**B**	**Y**
0	**0**	
0	**1**	
1	**0**	
1	**1**	

5. Given the input A, find the output Y of the given gate (6 pts):

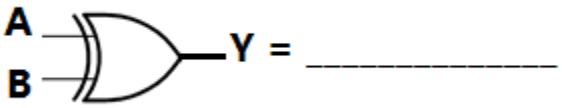
$A = 1001110_2$  Y = _____

6. Given the input A and B, find the output Y of the given gate (6 pts each):

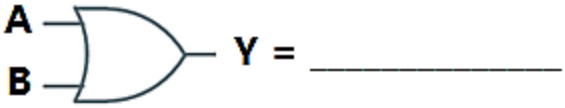
A = 0100 1011_2
B = 1110 1101_2



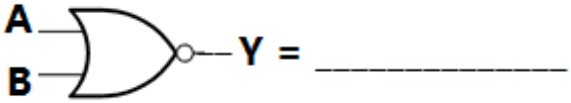
A = 1010 1100_2
B = 0110 0101_2



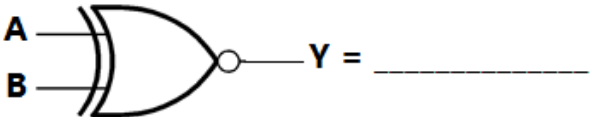
A = 1100 1100_2
B = 1010 0011_2



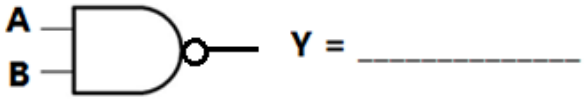
A = 1010 1100_2
B = 0110 0101_2



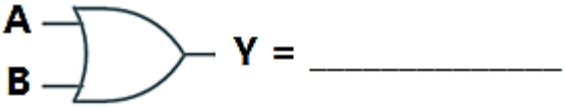
A = 0100 1011_2
B = 1110 1101_2



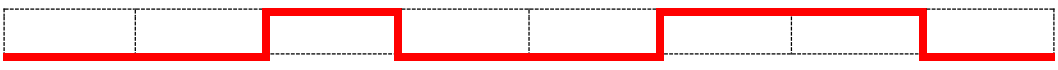
A = 1010 1100_2
B = 0110 1101_2



7. Given the input waveform A and B, find the output Y of the given logic gate (11 pts)



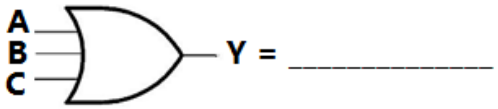
A

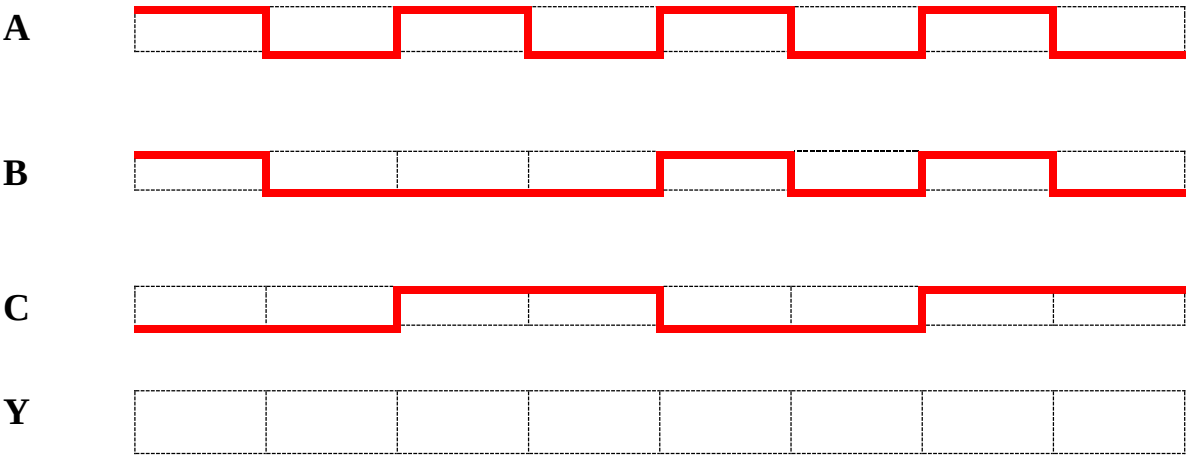


B

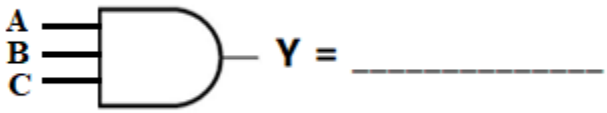
Y

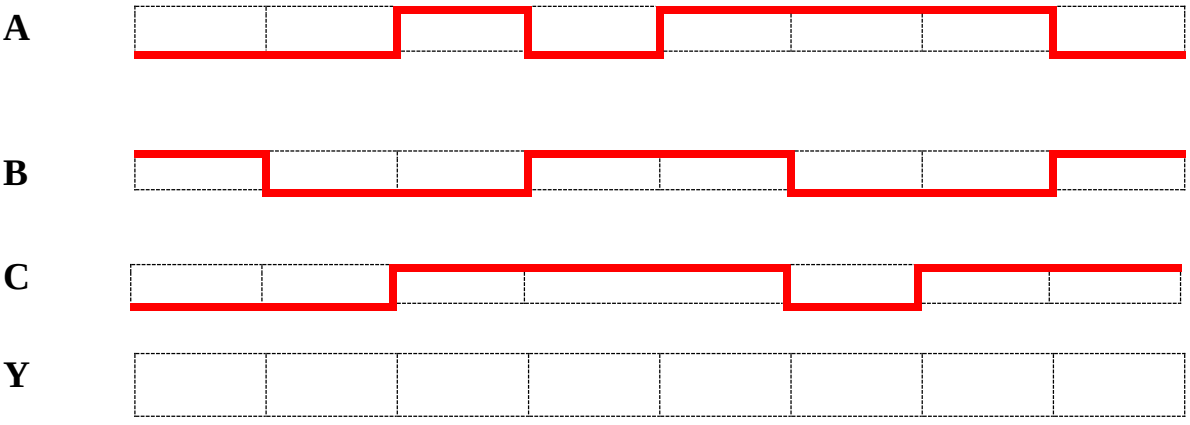
1. Given the input waveform A, B, and C, find the output Y of the given logic gate (12 pts)





2. Given the input waveform A, B, and C, find the output Y of the given logic gate (11 pts)





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