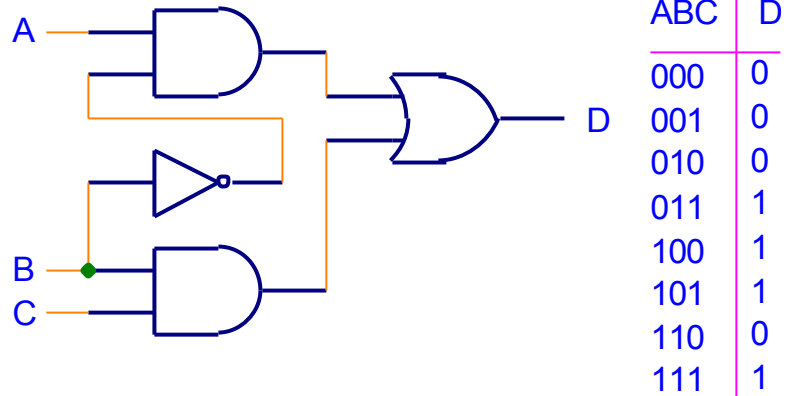**Homework #9   Digital Logic Gates**

1)a) Fill out the truth table for the following circuit.

b) What do you think this circuit is (what could it be used for)?

It could be a multiplexer (MUX). B would be the select line. When B is high, C goes through to the output. When B is low A goes through to the output.

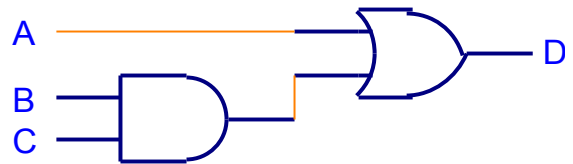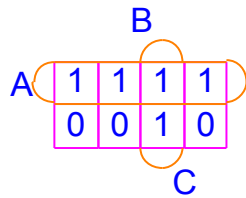| ABC	D
000	0
001	0
010	0
011	1
100	1
101	1
110	0
111	1

2) Use logic gates to construct a circuit such that it matches the following truth table. It may be helpful to look at the Karnaugh Maps section (starting at pg. 31): http://www.uotechnology.edu.iq/dep-eee/lectures/1st/Digital%20techniques/part2.pdf

ABC | D
0 0 0 | 0
0 0 1 | 0
0 1 0 | 0
0 1 1 | 1
1 0 0 | 1
1 0 1 | 1
1 1 0 | 1
1 1 1 | 1

Looking at the truth table we can see that the output is one whenever A is one or when B & C are one. The Karnaugh map also shows the simplification to A+BC.