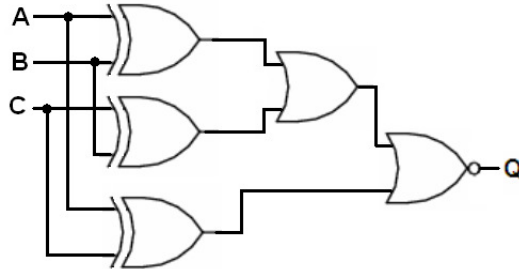# Electronics

Logic Gates

Problem 1.- Find the truth table of the following combination of gates. Notice that it will have 8 rows. Then, make up a name for the combination.
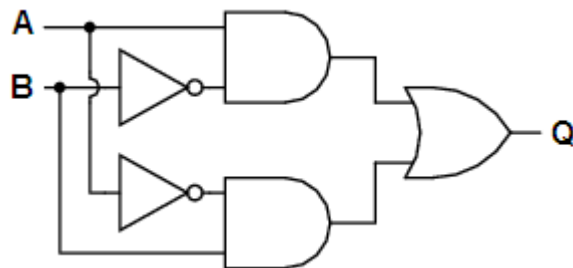

Solution: The table will be as follows

A	B	C	Q
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

Proposed name: "**égalité**"

Problem 2.- Find the truth table of the following circuit. Make up a name for it.

Solution: To analyze the circuit we should look at each entry in the truth table. The four possibilities are:

A	B
0	0
0	1
1	0
1	1

The first AND gate will have an output of 1 only when A is 1 and B is 0. The second AND gate instead will have an output of 1 only when A is 0 and B is 1. The output of the OR gate will be 1 only when either AND gate is 1, so the truth table will look like this:

A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0

There is already a name for this circuit: Exclusive OR, but we will call it "**vive la différence**".

Problem 3.- What is wrong with connecting an LED directly between a TTL output and ground?

Solution: The output of a TTL device is rated 5V, which is too much for an LED. The preferred way of connecting an LED is with the TTL output as a "sink" and using a 330 Ω in series as a limiting resistor.

Problem 4.- Find the truth table of the following circuit. Make up a name for it.