Lab 1

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Prelab: Diagram, schematic

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Purpose:

The purpose of lab 1 was to further acquaint ourselves to the tools of the lab(Multism and the breadboard) by making circuits that proved DeMorgan’s Laws.

Lab Procedure:

We started the lab by using Multism to simulate our 4 circuits that would prove DeMorgan’s theorem (x+y)’ = x’y’ and (xy)’ = x’+y’. We used the Word Generator that was set to an internal clocking frequency of 1KHz, a buffer size of 4, and a pattern that counted up. We also used the Logic Analyzer that was set to the same internal clocking frequency as the Word Generator and clocks er division to 2, then we connected the Word Generator to the Logic Analyzer with an AND gate and inverter for the first circuit, 2 inverters and an OR gate for the second circuit, an OR gate and 1 inverter for the third circuit, and 2 inverters and an AND gate for the fourth circuit, then took notes of the output based on the Logic Analyzer.

For the second part of the experiment, we used the breadboard, a hex inverter, an AND gate, an OR gate, wires, and LEDs to make all four circuits(the LEDs were used to see the output of the circuits with a high output being LED on and a low output being LED off).

Multism screenshot-

A picture containing graphical user interface

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Breadboard circuit-

A picture containing text, electronics

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Conclusion:

In this lab, we further acquainted ourselves with Multism and the breadboard by making circuits that proved DeMorgan’s Laws. The results of this lab proved the laws (x+y)’ = x’y’ and (xy)’ = x’+y’ by showing us when there was a high output on the left side of either equation, there was a high output on the right side of the equation and when there was a low output on the left side of the equation, there was a low output on the right side of the equation.

Finally, I believe physically constructing a circuit is more beneficial to my learning experience.

Observations:

The main observation I have to improve my performance on future experiments is to further learn how the circuitry on paper or in the simulation transfers to the circuitry on the breadboard.