Lab 03

Multifunctional Logic Circuit

ECE 380-002

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**Introduction**

In Lab#03, our team designed, built, and tested a multifunctional logic circuit that implements multiple logic functions. We use the Quartus II CAD tool to design the circuit and write VHDL code. After compiled the files, we test the designs on Altera’s DE1 board and valid the outcome in the prelab truth table.

**Procedure**

1. Prelab

In the prelab, we firstly analyze the problem and finish the truth table of the function. We also make a K-Map of the function, calculate the function through minimum term method and build truth table. Finally, we draw the NAND-only schematic on the paper.

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Then we created two projects for two different circuit implementations, the VHDL and schematic.

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1. During the Lab
2. VHDL Part

We compile the file and run simulation for the file. The result is same as we predict in the prelab. Then we import the file to the Altera’s DE1 board and set the switches by the instruction of the TA. We test the function on the board by different combination of switches to check if the function import to the board is same as we predict.

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1. Schematic Part

We compile the schematic file and test the file. Then import to the board, after setting the switches, we test the different combination on the board.

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**Result**

The testing schematic file and VHDL file are same as we predict in the prelab.

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**Conclusion**

During the lab, we understand how to configure the Altera’s DE1 board and test the function through VHDL method and Schematic method to check the actual result from the board is same as we predict in the prelab.

A close up of a device

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