ELEC 2210 LABORATORY REPORT COVER PAGE

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Meeting # 002 Experiment 1: Basic Digital Logic CIrcuits

Title of Lab Experiment

Student Name: Howard Jacob, A

Name (Last, First, MI)

Student Email: JAH0147

AU 7-character username

GTA: Jonathan

Name of your GTA

Section you are enrolled in: (Circle One): 1 2 3 4 5 6 7 8

Date experiment performed (dd / mm / yy): *25/8/20*

Date report submitted: (dd / mm / yy): *31/8/20*

If you performed this experiment at a time other than your regularly scheduled section meeting:

Section # of the section you sat in on (Circle One): 1 2 3 4 5 6 7 8 Makeup

Name of the GTA who supervised your work: _____

I hereby certify that the contents of this report are true and complete to the best of my ability. The lab work was performed by me exclusively, and this report was written by me exclusively.

Jacob Howard 8/31/20

Student signature Date signed

ELEC-2210
Digital Electronics

FROM: Jacob Howard

TO: Yili “Jonathan” Wang

LAB DATE: 8/25/20

DUE DATE: 9/1/20

LAB SECTION: 002 (Tuesday, 1:00pm-2:50 pm)

EXPERIMENT 1:
Basic Digital Logic Circuits

Introduction

This week's lab was our first in-person Lab. We were to do a pre-lab beforehand that would be used for the Lab. The main objective of this lab was to get us comfortable with the equipment we will be using in future labs. We used the NI ELVIS breadboard for easy circuit design and some NI ELVIS software. The lab consisted of 5 parts, with the fifth part just being a lab clean-up.

Step 1

In step 1, we were introduced to DIP switches and the 7400 quad NAND gate. For the first part, we only used the DIP switch and a resistor pack with a couple connecting wires to make 3 LEDs light up. This section was getting us familiar with the parts and helping us understand the way the DIP switch works. This first step was simple; just connecting the switches and resistor pack to the LEDs.

Step 2

In step 2, we added a new component to the ELVIS board; the 7400 quad NAND gate. The 7400 chip is 4 NAND gates inside one component. The main objective of this part was to prove that our truth table of the NAND gate was correct from our Prelab. The TA came over to check and make sure we got the correct values, and this was all we had to do for part 2.

Step 3

In step 3, we were to construct a multiplexer. By connecting the 3 inputs, A, B, and S, to the correct ports in each NAND gate and connecting the outputs as inputs of the last NAND gate we could achieve the Multiplexer function output from our Prelab design. I was slightly confused

at first on how to wire everything up, but once I figured out that “S” needed to be wired twice to the same NAND Gate to get “S NOT”, the design became quite simple. Once everything was wired to the 7400 NAND Chip, we were able to receive the same outputs as our prelab. The 7400 Chip NAND design is shown in *Figure 1* below.

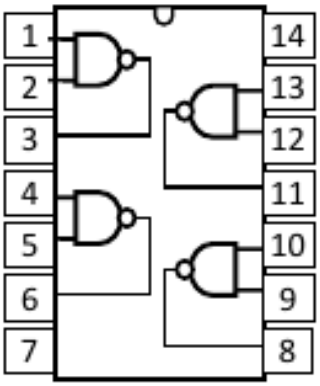

Figure 1

Step 4

For Step 4, we were supposed to use the NI ELVIS Digital Reader and Digital Writer programs one the Lab Computers to verify the truth table of the 7400 quad NAND gate. For some reason, in our Lab, some of the computers would not launch the programs or the programs were not working correctly. The TA addressed that this was a problem for some. So, for some, including me, we were unable to verify the truth table. I will provide the truth table below we were supposed to verify in this step shown in *Table 1*.

A	B	Z
0	0	1
0	1	1
1	0	1
1	1	1

Table 1

Conclusion

In Conclusion, this lab was a great way to introduce us to some of the components we will be working within future labs. There was some learning curve, but I believe this lab was a good starting point for us to get accustomed to some of the logic chips, the ELVIS Board, and some of the software. This was the first time I was introduced to in-world DIP switches and NAND Gates and I think it was an easy enough lab to get accustomed to those parts and future in-lab materials.