

The Pencil Box Lab

ICs and Logic Gates, Lab #3

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ABSTRACT

This lab consisted of testing ICs functions (Logic gates) using a pencil box.

Experiment Performed on **6 September 2019**

Report Submitted on **13 September 2019**

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INTRODUCTION

Using our theory from the class we had before about ICs and logic gates, we applied that knowledge in this lab. Using a handful of ICs and a pencil box, we tested the key functions of the ICs with their specific logic gates using the pencil box (testing their operations using truth tables specific to them). Also, we gained insight on how to identify/read ICs and to read data from truth tables of specific logic gates. Below outlines my work during the lab.

OBJECTIVES

- To study and verify the truth table of logic gates.
- Identify various ICs and their specification.
- To keep familiarizing with ICs and Logic gates.
- To keep enhancing our knowledge with the pencil box.

MATERIAL USED

- Logic gates (IC) trainer kit.
- Wires.
- IC 7400, IC 7408, IC 7432, IC 7406, IC 7402, IC 7404.

PROCEDURE

(To test specific ICs on the breadboard and to verify their operation)

- (1) Make sure pencil box is selected for TTL operation.
- (2) Take IC and place between the 2 sections of the breadboard horizontally (Parallel to the long edge of the breadboard).
- (3) Take one wire, connect to ground on pencil box, then connect to pin 7 on IC (Ground).
- (4) Take one wire, connect to 5v+ on pencil box, and then connect to pin 14 on IC (Vcc).
- (5) Depending on the IC being used, consult its datasheet to make the following connections (*This only applies to step 6 and 7*).
- (6) Take x number of wires, connect to individual switches on pencil box, then connect as your 'INPUTS' on the IC. *
- (7) Take 1 wire, connect to LED on pencil box, and then connect as your 'OUTPUT' on the IC.
- (8) Ensure all connections are correct, then power on pencil box.
- (9) Use the switches in the pencil box to analyze the state of the LEDs. **
- (10) Use the truth table specific to the IC being used and compare it to the state of the LEDs.

*x defines the number of inputs the specific IC has.

**LED on = 1, LED off = 0.

RESULTS AND DISCUSSION

**The results to this lab are attached behind this lab report.*

CONCLUSION

To conclude, the purpose of this lab was to verify certain functions of ICs using truth tables specific to them (Logic gates). Using the procedure outlined above, the task was achieved successfully. This lab does not only benefit to ICs but also the pencil box. Being introduced to the pencil box and understanding its capabilities means we could use it beyond and for ICs.

REFERENCES

(Pictures that were taken during the lab)

