
School of Computing
Computer Science Program

CDA 3101

Introduction to Computer Logic

Lab # 8

Student Name: _____

Student N-Number: _____

| | | | |
|---|---|---|---|
| **Student Name** | | | |
| **Lab Name** | **Lab 8 : RAM Memory** | | |
| | | | |
| **Lab Checklist** | **Available Points** | **Received Points** | **Information** |
| | | | |
| | | | |
| Printed Schematic | 30 | | See note 7 below |
| | | | |
| | | | |
| Proper operation of the circuit. | 50 | | |
| | | | |
| | | | |
| Required documents | 20 | | Printed lab |
| | | | |
| | | | |
| **Circuit Demo (worked correctly)** | Yes / No | | Must fully function to receive a grade above zero. Note 1 below |
| | | | |
| **Date:** | | | |
| **Verified by:** | | | |
| | | | |
| **Final Lab Grade** | | | |

**Notes for Scoring:**

**Note 1:** A final grade of "0" will be assigned if the circuit demonstration fails to work completely.

**Note 2:** Lab assignments will not be accepted late.

**Note 3**: Any assigned quizzes that are associated with this lab will be taken on Canvas unless otherwise noted.

**Note 4**: All submitted documents from CAD software (ex: Multisim) must contain the student's name and UNF n-number printed via the software (insert text). No name and number; no points!!!!

**Note 5:** No "print screens" will be accepted from CAD software. Print all documents using the print function within the software.

**Note 6**: The entire lab assignment must be printed and submitted with any other required documents.

**Note 7:** *A wiring diagram (schematic) must reflect what is actually built on your hardware trainer. All chip pin numbers, switches, lights, and etc. must be labeled. All input and output signals must be labeled as well as all input and output bit-weights. Do not include any equipment or components that are not used with your lab (ex: logic analyzer).*

**Note 8:** The lab must be demonstrated and submitted to either a lab TA or the instructor during a scheduled lab session. Labs will not be graded outside of this time unless authorized by the instructor.

## Lab 8: RAM Memory

The purpose of this lab is to familiarize the student with static RAM memory.

**Equipment needed:**

2016 / 6116 (SRAM)
74LS244 / 74LS126
Other Assorted TTL chips
Logic Trainer

**Pre-lab:**

**A)** Design a circuit that will demonstrate the operation of a 2016 static RAM. The four input-output (I/O) lines will be connected to four logic indicators (LEDs) on the trainer. Use four input logic switches for data input to the unit. The switches will connect to the I/O pins through a tri-state buffer (74244 / 74126). The four low order address lines will connect to the remaining four logic switches. Set the other address lines to ground.

Note that the tri-state buffer will act to isolate the logic switches from the memory outputs during a read operation. It will set the buffer to the high impedance state when reading the memory. See your class notes for wiring instructions.

**B)** Use CAD software to create wiring schematics for this lab.

**C)** Print the schematics for use in class and for final grading.

**Note:** *Your prelab material should be complete prior to the lab session!*

**Using the Hardware Trainer:**

Build the circuits, and test for proper read / write operation. Be prepared to demonstrate these operations at any address location from 0000 - 1111. In other words, you should be able to write 4-bit patterns to multiple address locations between 0000 – 1111, and then read back these patterns.

**Grading:**

Be prepared to demonstrate your working project in class. <u>You must provide all required documents at the time of inspection or the lab will not be graded.</u>