



Department of Computer Science and Engineering

Course Code: CSE260	Credits: 1.5
Course Name: Digital Logic Design	Semester: Fall 18

Lab 07

I. Topic Overview:

Design a circuit that outputs 2's complement of a 3 bit number using encoder & decoder.

II. Lesson Fit:

Knowledge of 2's complement number system. A lab sheet with the necessary circuit diagram will be provided to the students at the beginning of this lab.

III. Learning Outcome:

After this lecture, the students will be able to:

- Understand the hardware system to calculate 2's complement of a 3 bit number.
- Have ideas regarding encoder and decoder.

IV. Anticipated Challenges and Possible Solutions

- Task 3: Students may find that their newly built circuit is not working or the outputs aren't matching with the truth table. .

Solutions:

Check the pin configuration from the lab sheet given to the students. Now check whether other connections are put correctly or not.

V. Acceptance and Evaluation

Students will show their progress as they practice throughout the tasks. They will be marked according to their class performance (if teacher wants). If they face any problem, they will try to solve by themselves or they can take help from the teacher.

VI. Activity Detail

a. Hour: 1

Discussion:

Brief theoretical knowledge regarding 2's complement number system, encoder and decoder. Understand the differences between 3*8 decoder and 8 to 3 decoder.

b. Hour: 2

Discussion:

Observe the circuit diagram on the lab sheet. Understand the truth table of 3 bit numbers using 2's complement system. Take necessary components to build the circuit and start building the circuit.

c. Hour: 3

Discussion:

Build the circuit and observe the outputs based upon the truth table. Discuss with others and take necessary feedbacks. If the outputs don't match, then try to find out the reason and solve it.

VII. Home tasks

- a. Lab report on this lab activity. The lab report should contain the following:
 - Name of the experiment
 - Objective
 - Required Components and Equipment
 - Experimental Setup (i.e., diagram of the circuit)
 - Results and Discussions
 - Draw a circuit diagram with encoder and decoder that will output the 1's complement of 3 bit number.
 - Can you implement a code converter with encoder and decoder? If yes, how? If no, explain why not

Lab 7 Activity List

Task 1

Create the Truth Table for 2's complement output of 3 bit numbers.

Task 2

Briefly understand the pin configuration of IC74138 and IC74148. Build the circuit according to the circuit diagram given on the lab sheet.

Task 3

Verify the outputs of the newly built circuit based upon the truth table. If problem occurs, try to check the connections and solve it.