Instructions:

- Please create and maintain a lab notebook for computer organization course.
- In your lab-book, remember to write your steps/methods, and the observations/results.
- Get TA’s signature after you have shown him/her your completed Lab-work.

Objective of Lab:

- To create finite state machine (FSM) logic using combinational and storage elements

Learning outcomes – 2 experiments:

- Create FSM state diagram based on system description
- Make truth table based on state diagram functionality
- Convert truth table to logic using combinational and storage elements
Experiment No. 1

Make a FSM to control a blinking traffic sign consisting of 7 LEDs. The LEDs of traffic sign, turn on as follows,

- No lights on
- 1 & 2 on
- 1, 2, 3, & 4 on
- 1, 2, 3, 4, 5, & 6 on
- 1, 2, 3, 4, 5, 6, & 7 on
- (repeat as long as switch is turned on)

The sequence described above progresses every two seconds. Draw the state diagram, create the truth table and logic to realize this system.

Simulate the logic using Logisim and check for functionality.

Experiment No. 2

A vending machine sells cold drink cans for 35 rupees. The machine takes coins of denomination 5 rupees and 10 rupees. After you put in each coin, you push a pushbutton to register the coin. If at least 35 rupees has been put in the machine, it will output a cold drink can and proper change (if applicable). Draw a finite state machine that describes the behavior of the machine. From the final state, the next coin that is put in will start the process again.

Create the truth table and logic to realize this system. Also simulate the logic using Logisim and check for functionality.