

## CSE 234 Logic Circuits and Digital Design

### Lab 3

#### Lab Session (Exact Duration: 60 min):

Design a circuit such that it will output 1, if the sum of the number's decimal digits is 5 or 7. The input is 5-bit numbers.

For instance, if the input is 14 or 25 the sum is  $1 + 4 = 5$  and  $2 + 5 = 7$ , therefore the output is 1. For instance, if the input is 17, the sum is  $1 + 7 = 8$  so the output is 0.

- First draw the truth table for this problem.
- Then write down the Boolean expression for the output where each row is represented as a product term in sum of products form.
- Then simplify the resultant Boolean expression. During simplification you have to use one XNOR gate where  $A \text{ XNOR } B = A'B' + AB$ .
- Design your resultant simplified circuit using Logisim.

#### Demo Session:

During demo, explain and simulate each step of your design. Do not forget you only have at most 4 minutes for that. Also you will answer any questions asked by the TA.