Department of Computer Engineering
Faculty of Engineering, University of Peradeniya

CO221: Digital Design | Lab 03

Date - 09/07/2019

Aims and Objectives

At the end of this lab session, you are expected to be able to develop simple circuits using Proteus ISIS designing environment.

Exercises

1. Using Proteus, implement a circuit to verify the functionality of basic logic gates (AND, OR, NOR, NAND, NOT).

2. Consider the following boolean expression.

   Z = A + CB + (A + B')(C' + B)

   a. Using Proteus, implement the logic circuit for the above expression **without simplifying**.
   b. Obtain the truth table for the above expression.
   c. Simulate the circuit in Proteus and verify the correctness of the outputs using the truth table

3. Design a logic circuit for the following situation

   A lamp outside a front door comes on automatically when it is dark and someone stands on the doormat outside the front door. A pressure sensor under the mat changes from OFF (0) to ON (1) when someone stands on the doormat. The light sensor is ON (1) when it is light and OFF (0) when it is dark. The lamp can also be turned on at any time using a switch.

   Inputs: Light Sensor
   Pressure Sensor
   Switch

   Outputs: Lamp