

COE 202, Term 141

Digital Logic Design

Assignment# 2

Due date: Thursday, Nov. 20

- Q.1.** It is required to design a combinational circuit that counts the number of 1's in an n-bit number X.
- (i) Design a circuit that receives a 4-bit number and computes the number of 1's in the number. Show the truth table and derive the simplified equations.
 - (ii) Verify the correctness of your 4-bit 1's count circuit design by modeling and simulating it using LogicWorks.
 - (iii) Using your design in part (i) and any additional components, design a circuit that receives an 8-bit number and computes the number of 1's in the number.
 - (iv) Verify the correctness of your 8-bit 1's count circuit design by modeling and simulating it using LogicWorks.
 - (v) Discuss how the design can be extended to be used for counting the number of 1's in an n-bit number.

This assignment can be solved based on a group of two students. Include snapshots of simulation output to illustrate the correctness of your circuit. Submit your solution as a word document along with the circuit in one zipped file.