Department of Electrical and Computer Engineering
The Johns Hopkins University
520.137 Introduction to Electrical and Computer Engineering – Fall 2018

Homework Assignment IV

Reading Assignment: Kuc Chapter 4. Kerns-Irwin Chapter 13. Lecture Notes.

1. Use Boolean algebra to prove the following identity

$$ABC + AB\overline{C} + A\overline{B}\,\overline{C} + A\overline{B}C = A.$$

   Construct a truth table to confirm your algebra.

2. Construct truth tables to prove the following equalities

   (a) $A\,(B + C) \;=\; AB + AC$

   (b) $\overline{ABC} \;=\; \overline{A} + \overline{B} + \overline{C}$

   (c) $\overline{A + B + C} = \overline{A}\,\overline{B}\,\overline{C}$

3. Design a CMOS 2-input AND gate, 2-input OR gate, and a 2-input XNOR gate (XOR with inverted output).

Due date: **Fri, October 5** in class