CARLETON UNIVERSITY
School of Computer Science

COMP 2003 Computer Organization

Fall 2005

Assignment 1

Due date: October 4, 5 PM (MUST be submitted through the Raven system)
Paper assignments will NOT be accepted.

1. What are the main components of a system bus? Describe the functionality of each component.

2. What is the purpose of virtual memory?

3. Show how a 5-input XOR gate can be constructed using only 2-input XOR gates.

4. Show that the following two logical expressions are equivalent using the Boolean algebra method (Do NOT use the truth table method or Karnaugh map method):

$$\overline{B}\ \overline{D} + A\ \overline{C}\ D + A\ B\ D$$

$$\overline{B}\ \overline{D} + A\ \overline{B}\ \overline{C} + A\ B\ D$$

5. Show the truth table of a function that outputs a 1 whenever the 4-bit input, treated as representing a 4-bit unsigned binary number, is between 5 and 10 (both inclusive). Derive a simplified logical expression using the Karnaugh map method. Show an implementation of this function.