

Southern Polytechnic State University
School of Computing and Software Engineering
IT 3123 Hardware / Software Concepts

Your Name: _____

IT 3123 – BROWN
Sample Examination Questions
June, 2011

Directions: This sample examination is intended to give you an idea of the *kinds* of questions that will be on a real exam. You do not have to complete it. Remember, this is only a sample; real exams will be longer! (And have space for your answers on the exam.)

1. Who was John von Neumann? In your answer, give at least two of von Neumann's contributions to computer science.

2. Form the two's complement of this unsigned binary number. Show your work.

00110101

3. Explain how a computer can perform subtraction using only inverters and adders.

4. Convert the following binary number to hexadecimal.

01111011

5. Using 32 bits to represent a binary integer, we can express numbers from -2^{31} to $+2^{31}-1$. If we use 32 bits to represent a number in floating point format, we can represent numbers in the range $\pm 10^{38}$. Explain how the floating point format can express so much larger a range using the same number of bits.

6. Approximately what is the decimal value of 2^{20} ?

7. We discussed seven types of *useful* digital logic gates. Name any two of them, draw their digital logic symbols, and write the truth table for each.

8. Explain the difference between the **program counter** and the **instruction register**.

9. What does a **full adder** do that a half adder does not?

10. Convert the following binary number to decimal; show your work.

01011101