COMP 122/L Practice Exam P1

This is representative of the kinds of topics and kind of questions you may be asked on the midterm. In addition to this practice exam, you should also review:

- The handouts
- Labs

1.) In decimal, how much is a 8 in position 5 worth?

2.) In binary, how much is a 1 in position 7 worth?

3.) In hexadecimal, how much is a E in position 4 worth?

4.) Convert decimal 19 into 8-bit unsigned binary. Show all work, including value of each digit.

5.) Convert unsigned binary 1101 1101 into decimal. Show all work, including value of each digit.

6.) Convert **two's complement** binary 1101 1101 into decimal. Show all work, including value of each digit.

7.) Consider the following binary number:

1110 0110

Is it possible to tell if this number is in unsigned or two's complement representation? If yes, explain how. If not, explain why.

8.) Convert decimal 2028 to 4-digit hexadecimal. Show all work, including value of each digit.

9.) Convert decimal -882 to 4-digit hexadecimal. Show all work, including value of each digit.

10.) What is: 1111 1101 + 0100 0101? Specify if the result has a carry-out set and if the result sets the overflow bit. Show all work.

11.) What is 1111 1100 + 1000 0000? Specify if the result has a carry-out set and if the result sets the overflow bit. Show all work.

12.) What is 1111 1100 - 1000 0000? Specify if the result has a carry-out set and if the result sets the overflow bit. Show all work.

13.) What is 0x3F & 0x5A? Provide the answer in two-digit hexadecimal. Show all work.

14.) What is 0x4E | 0xB2? Provide the answer in two-digit hexadecimal. Show all work.

15.) What is 0x7A ^ 0x14? Provide the answer in two-digit hexadecimal. Show all work.

16.) What is ~0x87? Provide the answer in two-digit hexadecimal. Show all work.

17.) What is 1101 0001 << 3? Express your answer in 8-bit binary.

18.) What is 1100 0101 >> 2 for **logical** shift right? Express your answer in 8-bit binary.

19.) What is 1100 0101 >> 2 for **arithmetic** shift right? Express your answer in 8-bit binary.

20.) What is 0100 0101 >> 2 for **arithmetic** shift right? Express your answer in 8-bit binary.

21.) Specify the mask and operation you would need to isolate bit 6 of an unknown 8-bit number. The result of the operation should be 0 (0x00) if bit 6 is 0, and non-zero if bit 6 is 1. The mask should be represented in 8-bit binary.

22.) Specify the mask and operation you would need to set bits 1 and 4 of an unknown 8-bit number to 1. The result of this operation results in a new number, which the unknown number will be subsequently set to. The mask should be represented in 8-bit binary.