

COMP 122/L Practice Exam #1

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 handout we did together in class
- Labs 1-3

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 $0x4E \mid 0xB2$? Provide the answer in two-digit hexadecimal. Show all work.

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

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

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

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

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

20.) What is $0100\ 0101 \gg 2$ 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.

23.) Consider the following 32-bit binary number:

1000 0110 1111 1101 0000 0010 0000 0000

What is the value of this number, if treated as a 32-bit floating point number according to the IEEE-754 standard? Show all work.

24.) Consider the following floating point number: 12.609375

Convert this to a 32-bit floating point number according to the IEEE-754 standard. Show all work, including each of the 8 steps.