Quiz 1, CSCI 210, Spring 2004

Name: _____

1. [6 pts] Approximate 2^{32} in the form $x \times 10^y$, with x and y both being base-10 numbers. (Your answer need not be normalized.)

2. [8 pts] Suppose we are using an 7-bit floating-point representation with 3 bits for the excess-3 exponent and 3 bits for the mantissa, supporting the denormalized and the nonnumeric cases.

a. What bit pattern represents $13_{(10)}$?

b. What is the smallest positive number representable in this system? Express your answer as a decimal number or a base-10 fraction.

3. [8 pts] Explain in detail what the HYMN CPU does during the fetch phase of the fetch-execute cycle. (Your explanation should describe how the computer accesses values in registers and memory.)

4. [8 pts] Explain in detail what an Intel x86 processor does during the execute phase for a `ret` instruction. That is, how do the values in registers change? How does the computer determine which instruction to fetch in the next fetch phase?