## Week Two Tuesday 01.04-01.05 Free Response

## Spring 2021

1) For the base-10 number 3.4, do the following.

a) A hypothetical computer stores base-10 numbers in a fixed-point format in 8-bit binary words. The first 5 bits are used for the integer part, and the last 3 bits are used for the fractional part. How would the base-10 number be represented in this binary format?

b) A hypothetical computer stores base-10 numbers in a floatingpoint format in 8-bit binary words. The first bit is used for the sign of the number; the second bit is used for the sign of the exponent; the next three bits for the *unbiased* exponent; the last three bits for the magnitude of the mantissa. How would the base-10 number be represented in this binary format?

c) <u>Dr. Kaw will show you how to do this but read the question to see</u> <u>how it is different form part (b)</u>. A hypothetical computer stores base-10 numbers in a floating-point format in 8-bit binary words. The first bit is used for the sign of the number; the next four bits for the *biased* exponent; the last three bits for the magnitude of the mantissa. How would the base-10 number be represented in this binary format?