COMP.2030 LAB 8

NAME: Platon S

1. Suppose are representing real numbers by the IEEE floating format with 5 exponent bits and 8 fraction bits (ignore the sign bit).

7/2=3 R 1
3/2=1R 1
1/2=0 R 1

a. What is the floating-point representation of the decimal number $7\frac{1}{7}$ in this format?

0.14285714286*2=0.28571428572 = 0
0.28571428572*2=0.57142857144 = 0
0.57142857144*2=1.14285714288 = 1
0.14285714288*2=0.28571428576 = 0
0.28571428576*2=0.57142857152 = 0
0.57142857152*2=1.14285714304 = 1
0.14285714304*2=0.28571428608 = 0

7.14285714286

111.00100$\overline{100}$
=1.1100100$\overline{100}$ x 2^2

2+127=129
=10000001

Exponent 10001 Fraction 11001001

b. What is the floating-point representation of the binary number $1.0011x2^{-2}$ in this format?

2^4 - 1=15
-2+15=13
=01101

Exponent 01101 Fraction 00110000

c. What is the floating-point representation of the binary number $1.0011x2^{-13}$ in this format?

-13+15 = 2

Exponent 00010 Fraction 00110000

2. Convert the DECIMAL value 11.1 into the IEEE floating format with a sign bit, a 5-bit exponent field, and a 10-bit fraction. Write your final 16-bit answer in Hexadecimal.

11/2 = 5 R 1
5/2 = 2 R 1
2/2 = 1 R 0
1/2 = 0 R 1

0.1*2= 0.2 =0
0.2*2= 0.4 = 0
0.4*2= 0.8 = 0
0.8*2= 1.6 = 1
0.6*2= 1.2 = 1
0.2*2= 0.4 = 0

1.01100$\overline{0011}$ x 2^3

3+15=18
=10010

0 10010 0110001101
= 0x498D