

Name _____

ID _____

York University

Dept. of Computer Science and Engineering

EECS2021

Computer Organization

Quiz 3 – 15 minutes

Nov. 29th 2015

Question 1 – 6 points

Consider a 16-bit integer representation. What is the value of the 0xC000?

Assuming $0xC000 = 1100_0000_0000_0000$

Unsigned number

$$= 2^{15} + 2^{14} = 49152$$

2's complement

$$-2^{15} + 2^{14} = -16384$$

Sign-magnitude

$$-2^{14} = -16384$$

Question 2 - 4 points

If we multiply these two numbers (both are in IEEE754 format), what is the value in the exponent field in the result

4B101000 and 3B101000

4B101000 = 0100_1011_0001_0000_0001_0000_0000_0000

exp1 = 1001_0110 (=0x96=150) fraction1 =
001000000010000000000000

3B101000 = 0011_1011_0001_0000_0001_0000_0000_0000

exp2 = 0111_0110 (=0x76 = 118) fraction2 =
001000000010000000000000

The two fractions are small, will not cause overflow

The new exponent = exp1 + exp2 - 127 = 0x86 = 141

- What is the largest normalized value that could be represented in this format?

In binary = $1.1111\dots1 \times 2^{127} = 2^{128}$