

CSE340: Computer Architecture

Assignment 3

Chapter 3 - Arithmetic for Computers

Total Marks: 15 (Marks are indicated in third brackets after each question)

1. Perform multiplication between 1000 (Multiplicand) and 101 (Multiplier) using the **long multiplication** approach. Suppose the product and multiplicand registers are 8-bit and the multiplier register is 4-bit. *Demonstrate the contents of the multiplicand, multiplier, and product registers during each step.* Finally, show that your computation is correct by converting the multiplicand, multiplier, and product into decimal. [5]
2. Suppose $X = 7ACD0000$ and $Y = 5BCA0000$, perform $X * Y$ using IEEE floating point representation. [5]
3. Let's consider the value -71.3456 :
 - a. In a single precision system what is the **decimal value** of the bias exponents? [1.5]
 - b. In an 18-bit register having 6-bit for the exponent, what is the **decimal value** of the biased exponent? [1.5]
4. Let's assume you are executing instruction `mult $s0, $s1`. Now, write the MIPS code for *adding lower 32-bit of the multiplication result* with the value stored in `$t0`. [1]
5. Let's assume you are executing `div $s0, $s1`. Now *add the remainder of the division* with the value stored in register `$t1`. [1]