Homework #3 **4190.308 Computer Architecture**

Name: _____

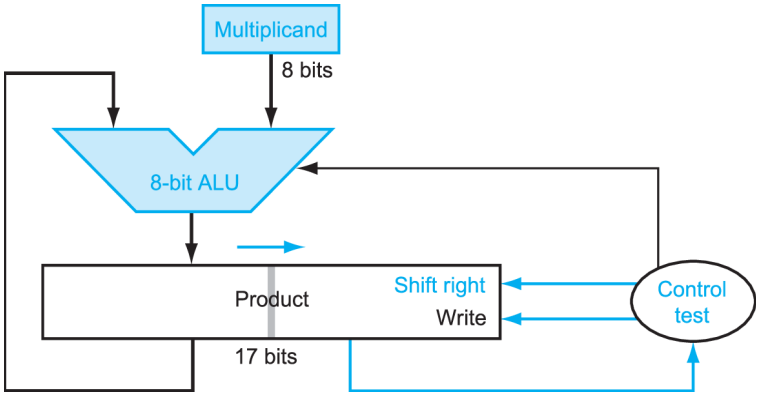
Due Date: Wednesday, March 29, 2023 **Student-Number:** _____

Submission: electronically on eTL (scan & upload)

Question 1

Integer Multiplication

For this problem we use a 16-bit version of the multiplier discussed in the book in Chapter 3.3 / Figure 3.5.

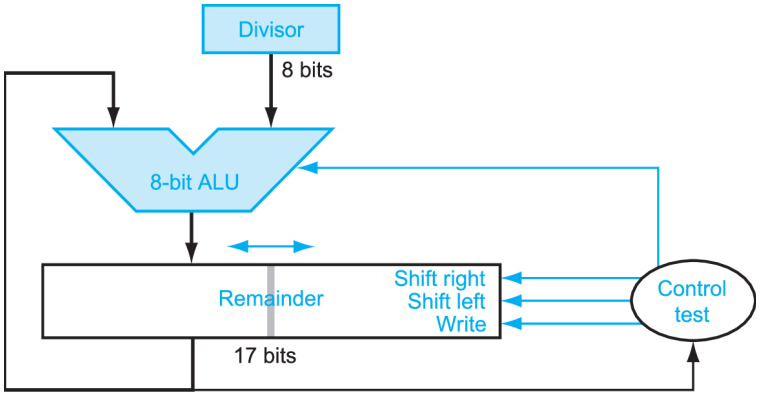


Compute the product 81 x 106 and show the values of the product register, the multiplicand register, and the action of control for each step.

Step	Product register	Multiplicand	Control
Init	`0 0000 0000 0101 0001`	`0110 1010`	

Question 2
Integer Division

For this problem we use a 16-bit version of the divider discussed in the book in Chapter 3.4 / Figure 3.11.



Compute the result of the division 97 / 5 and show the values of the remainder register, the divisor register, and the action of control for each step.

Step	Remainder register	Divisor	Control
Init	`0 0000 0000 0110 0001`	`0000 0101`	

Question 3
Floating Point Addition

Given is the floating point format “fp8” with the following organization.

sign	exp			frac			
7	6	5	4	3	2	1	0

The fields `exp` and `frac` are encoded in the same way as in the IEEE 754 standard. The bias is -3.

Compute the sum of a = 5.5 and b = 0.55 in fp8. Follow the steps outlined in the textbook, chapter 3.5. When rounding, use round-to-even mode.