

# 22C:060: Computer Organization Spring 2008

Assignment 5

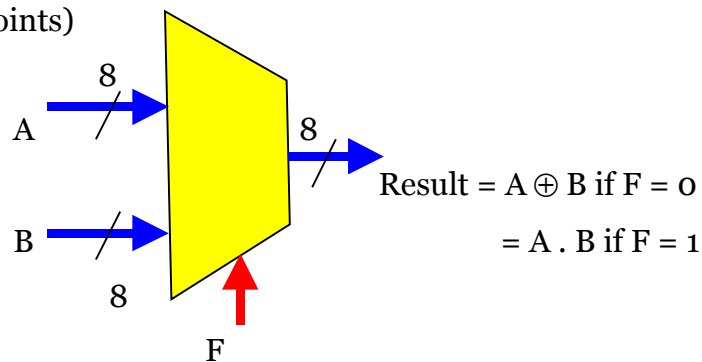
Total points = 50

Due April 17, 2008, 11:59:59 PM

*Submit your solution to the ICON drop box*

**Question 1.** (25 points) Show how to connect 8 (64M x 1 bit) RAM modules to design a (256M x 2 bit) memory. A *clean diagram* is essential. Briefly explain how your design will work.

**Question 2.** (10 points)



How will you implement the above **8-bit ALU** using a **ROM** chip? Explain your scheme, and show a part of the contents of the ROM (Hint: somehow you have to store the truth tables of the functions into the ROM, so that the result is obtained by a simple table lookup).

**Question 3.** (5+10 = 15 points) Hamming code helps correct all single errors in a given bit pattern.

- (a) How many error control bits will you need to correct single errors in a 64-bit word? In which positions will you store the error control bits, and what will be the total size of the word?
- (b) The following bit pattern was transmitted to **send a byte** using Hamming code. Assuming all checks use odd parity only, find out the **value of the byte** that was transmitted. Explain your steps.

12	11	10	9	8	7	6	5	4	3	2	1
1	0	1	1	0	0	1	1	1	0	1	0