State University of New York – New Paltz
Electrical and Computer Engineering Department
Microprocessor Systems Design
Homework # 3
Due: Monday April 5th, 2004

Question 1:
Describe a ADD ACCUMULATOR instruction cycle in the case of using indexed addressing mode. Assume that the operand is $0A, and the content of the index register is $2000.

Question 2:
A. The instruction in locations $010C and $010D is BRA XX. Where will the program branch to for each of the following values of XX?
   a) CA
   b) 5B
   c) B1
   d) F3
B. The instruction in locations $010C and $010D is BRA XX. What will be the offset if the target is as follows?
   a) 00F6
   b) 011C

Question 3:
1. Perform the following transformations using 8 bit representation (8 Marks)
   a) $(-12)_{10} = (?)_{2}$
   b) $(-56)_{10} = (?)_{16}$
   c) $(123)_{10} = (?)_{16}$
   d) $(E5)_{16} = (?)_{10}$
2. Perform the following hex additions: (4 Marks)
   a) $(5E)_{16} + (FA)_{16}$
   b) $(F1)_{16} + (A032)_{16}$
3. Perform the following hex subtractions (4 Marks)
   a) $(D0A)_{16} - (EE)_{16}$
   b) $(5800C)_{16} - (135CF)_{16}$
4. Perform the following division in Binary (4 Marks)
   a) $11101110/101$

Question 4:
   a) Design an assembly language program that reads a list of 10 values stored at locations starting at $0020, multiply this number by 2 and store the squares in a list starting at address $0040. (15 Marks for the flowchart, 15 Marks for the source code)
b) Assuming the 10 successive memory locations contain the decimal numbers 0, 1, 2, … 9, show the status of the H, N, Z and C bits of the CCR after the execution of your program for the last two values in the list i.e. values 8 and 9. (10 Marks)

*Good Luck*