Name: KEY **Id#**

COE 205, Term 043

Computer Organization & Assembly Programming

Quiz# 4

Date: Tuesday, July 26, 2005

Q1. Suppose that you have the following initial content of 8086 registers:

AX=FFDFH BX=0008H CX=0020H DX=0001H

(i) Determine the content of the **destination** operand after the execution of each of the following instructions. Indicate the effect on the **overflow** flag. Use the **initial content** of the registers for the execution of each instruction.

1. MUL BX
   DX:AX=AX * BX ; DX=0007 AX=FEF8; OF=1 because DX is not 0.

2. IMUL AH
   AX=AL*AH; AX=0021; OF=0 because AH is a sign extension of AL.

3. DIV BX
   DX:AX= DX:AX/BX; DX=0007 AX=3FFB; OF is undefined

4. IDIV CL
   AH:AL= AX/CL=-33/32; AH=FF AL=FF; OF is undefined

(ii) Write the minimum number of instructions to do the following using only **logical** instructions:

1. Clear bit 0, Set bit 7, and Complement bit 4 of register AL.

```
AND AL, 11111110B        Another solution:
OR  AL, 10000000B         AND AL,01111110B
XOR AL, 00010000B         XOR AL,10010000B
```

2. Change the content of AL register into **UPPER** case assuming that it contains either upper or lower case alphabetic characters.

```
AND AL, 1101111B
```

3. Store the content of register CX into register AX using only **XOR** instructions.

```
XOR AX, AX;     AX=0
XOR AX, CX;     AX = 0 XOR CX = CX
```