COE 205, Term 991

Computer Organization & Assembly Programming

HW# 4

Due date: Wednesday, Nov. 3

Q.1. Suppose that you have the following initial content of the following:

AX=FFFFH BX=0076H CX=4502H DX=CAE9H

Show the content of the destination operand and the state of the flag bits (O, S, Z, A, P, and C) after the execution of each of the following instructions. Use the initial content of the registers for the execution of each instruction. Suppose that the CF is initially set to 1.

1. NOT DX
2. AND AL, 45h
3. OR BX, CX
4. XOR AX, CX
5. TEST CX, 8431h
6. SAL DX, CL
7. ROL DX, 1
8. RCL DX, CL
9. ROR DX, CL
10. RCR DX, 1
11. SAR DX, CL
12. SHR DX, 1

Q.2. Assume the following 8086 code

```
        MOV   CX, count
iterate: LOOP  iterate
```

How many times is the LOOP instruction executed if count = 10 and count = -10, respectively?

Q.3. Write 8086 code to multiply the signed content of register AL by 24 using the smallest number of instructions possible:

(i) Without using the multiplication instruction.

(ii) Without using the multiplication and shift instructions.

Q.4. Consider the following 8086 code:

```
MOV SI, offset Table1
```

```
        MOV DI, offset Table2
        MOV BX, 0
        MOV CX, 12
NEXT:   MOV AL, [SI+BX]
        MOV DL, [DI+BX]
        MOV [SI+BX], DL
        MOV [DI+BX], AL
        INC BX
        LOOP NEXT
```

(i) Analyze the code and determine what it does.

(ii) Modify the code to implement the same functionality but without using the loop instruction.

Q.5. Write an 8086 assembly program that implements the following C code. Allocate the minimum required memory for the variables.

C version:

```
main()
{
    int I, J, A, B, C, F;
    I=4;
    J=-4;
    F=1;
    A=300;
    B=60;
    C=425;
     while ( (I>J) && (F==1) ) {
          I = I-1;
          A = A + B;
          if (A >= 660)
             F=0;
     }
     C = C - A;
}
```