

# COE 205 Computer Organization & Assembly Language – Fall 2006

## Assignment 3: Basic Instructions and Addressing Modes

**Professor:** Muhamed Mudawar

**Due Date:** Wednesday, October 11, 2006

**Q1.** (7 pts) Consider a program that has the following data segment:

```
I      EQU      7Fh
J      BYTE     '1234'
K      EQU      250
L      WORD     1234h, 8765h
M      DWORD    1, 2, 3, 4
```

Indicate whether the following instructions are valid or not. If valid, give the result of the operation in hexadecimal. If invalid, give the reason.

- |                                     |                                |
|-------------------------------------|--------------------------------|
| <b>a.</b> MOV AL, I+1               | <b>f.</b> MOV I, L             |
| <b>b.</b> MOV AL, J+2               | <b>g.</b> MOV EAX, DWORD PTR J |
| <b>c.</b> MOVSX EAX, L[1]           | <b>h.</b> MOV L, WORD PTR M    |
| <b>d.</b> MOV EBX, M[2]             | <b>i.</b> MOV ESI, L           |
| <b>e.</b> INC [ESI] ;ESI = OFFSET J |                                |

**Q2.** (6 pts) Suppose that you have the following initial register content:

```
AX=F2E9H   BX=0002H   CX=08A0H   DX=F1E0H
```

- Show the contents of *AX* and the flags (*CF*, *OF*, *SF*, *ZF*, *AF*, and *PF*) after executing:  
ADD AX, BX
- Show the contents of *CX* and the flags (*CF*, *OF*, *SF*, *ZF*, *AF*, and *PF*) after executing:  
SUB CX, DX
- Show the contents of *BX* and the flags (*CF*, *OF*, *SF*, *ZF*, *AF*, and *PF*) after executing:  
NEG BX

**Q3.** (7 pts) Write an assembly language program to copy the characters of a string in reverse order. Initialize a source string to: "This is the source string", and write a loop to copy its characters to a target string in reverse order.

**Hint:** Solve the above problems on a sheet of paper first. Then, to check your answers, write assembly language programs and trace them with the Windows debugger.