

St. No:  
St. Name:

# SOLUTIONS

## EENG410/INFE410 - Microprocessors I Quiz # 1 (Spring 2013/2014)

1. Find the status of the AX, CF, PF, AF, ZF and SF after the execution of the following instructions?

<p>a) MOV AX, 159CH MOV CL, AH MOV CH, AL ADD AX, CX</p>	<p>b) MOV DX, 75FAH MOV AX, 8C06H INC DL ADD AL, DH ADC AX, DX</p> <p>OX = 75FBH AL = 06 + 75 = 70H, CF = 0</p>
<p>MOV AX, 159CH MOV CL, AH MOV CH, AL ; CX = 9C15H, AX = 159CH</p> $\begin{array}{r} 159C \\ + 9C15 \\ \hline B1B1 \end{array}$ $\begin{array}{r} 0001\ 0101\ 1001\ 1100 \\ + 1001\ 1100\ 0001\ 0101 \\ \hline 1011\ 0001\ 1011\ 0001 \end{array}$ <p>AX = B1B1H CF = 0, PF = 1, AF = 1, ZF = 0, SF = 1</p>	<p>AX = 8C7BH OX = 75FBH 0276H</p> $\begin{array}{r} 1000\ 1100\ 0111\ 1011 \\ + 0111\ 0101\ 1111\ 1011 \\ \hline 0000\ 0010\ 0111\ 0110 \end{array}$ <p>AX = 0276H CF = 1, PF = 0, AF = 1, ZF = 0, SF = 0</p>

2. Write the definition of a subroutine, MYSWAP, that swaps the least significant and most significant bytes of register SI.

```

MYSWAP: MOV AX, SI
        MOV BL, AL
        MOV AH, AH
        MOV AH, BL
        MOV SI, AX
        RET

```

3. Given that DS=7890H, SS=987D#H, BX=7A5CH, BP=9A8BH, SI=7652H determine the Logical and Physical Addresses of the memory location of the source operands in the following lines of instructions?

a) MOV DX, [BP][SI]+7 ; Logical Address=....., Physical Address=.....

$$\begin{array}{r} 9A8B \\ + 7652 \\ + 7 \\ \hline 10E4 \end{array}$$

$$\begin{array}{r} 98700 \\ + 10E4 \\ \hline 998B4 \end{array}$$

b) MOV DL, [BX]+5 ; Logical Address=....., Physical Address=.....

$$\begin{array}{r} 7A5C \\ + 5 \\ \hline 7A61 \end{array}$$

$$\begin{array}{r} 78900 \\ + 7A61 \\ \hline 80361 \end{array}$$

4. Assume that the following array is given.

A = 75, 42, 15, 54, 93, 36, 55, 83, 35, 56

Write an assembly language program that defines the array A at the offset address 0050H. The program defines another array B at offset address 0150H. The program copies array A into array B in reverse order. Finally, the program finds the maximum value in array A and save the result to variable MAX at offset address 0250H.

```
• MODEL SMALL
• STACK 64
• DATA
ORG 0050H
A DB 75, 42, 15, 54, 93, 36, 55, 83, 35, 56
ORG 0150H
B DB 10 DUP(?)
ORG 0250H
MAX DB ?
• CODE
MAIN: MOV AX, @DATA
      MOV DS, AX
      MOV CX, 10
      MOV SI, OFFSET A
      MOV DI, OFFSET B
BACK1: MOV AL, [SI+9]
      MOV [DI], AL
      DEC SI
      INC DI
      LOOP BACK1
      MOV CX, 10
      MOV SI, OFFSET A
      MOV AH, [SI]
BACK2: CMP AH, [SI]
      JA NEXT
      MOV AH, [SI]
NEXT: INC SI
      LOOP BACK2
      MOV MAX, AH
      MOV AH, 4CH
      INT 21H
      END MAIN
```