Air University

Mid Semester Examinations: Spring 2025

Student ID : _____

Section I: Objective

(To be solved on Question Paper)

Subject: Computer Organization & Assembly Language
Class: BSSE IV
Section(s): B
Course Code: CS226

Time Allowed: 45 Minutes
Max Marks: 25
FM's Name: Ms. Asra Masood
FM's Signature:

INSTRUCTIONS

- Understanding of questions is part of the exam, no query will be entertained.
- Attempt all questions.
- Sharing calculators or any stationary item is strictly prohibited.
- Use of calculator is allowed.

Question 1 [CLO-1] **(4 Marks)**

Show values of the Carry, Sign, Zero, and Overflow flags after each instruction has executed:

```
mov ax,7FF0h
add al,10h      ; a. CF =1   SF =0   ZF =  1   OF = 0
add ah,1        ; b. CF =0   SF =1   ZF =  0   OF = 1
add ax,2        ; c. CF =0   SF =1   ZF =  0   OF = 0
mov bl,-1
add bl,130      ; d. CF =1   SF =1   ZF =  0   OF = 0
```

Question 2 [CLO-2] **(21 Marks)**

Show register values on the right side of the following instruction sequence:
Consider the following data definitions:

```
myBytes BYTE 10h,20h,30h,40h
myWords WORD 8Ah,3Bh,72h,44h,66h
myDoubles DWORD 1,2,3,4,5
myPointer DWORD myDoubles
var1 SBYTE -4,-2,3,1
var2 WORD 1000h,2000h,3000h,4000h
var3 SWORD -16,-42
var4 DWORD 1,2,3,4,5
```

```
mov esi,OFFSET myBytes
mov al,[esi]          ; a. AL =10
mov al,[esi+3]        ; b. AL =40
mov esi,OFFSET myWords + 2
mov ax,[esi]          ; c. AX =003B
```

```
mov edi,8
mov edx,[myDoubles + edi]                ; d. EDX =00000003
mov edx,myDoubles[edi]                   ; e. EDX =00000003
mov ebx,myPointer
mov eax,[ebx+4]                          ; f. EAX =00000002
mov esi,OFFSET myBytes
mov ax,[esi]                             ; g. AX =2010
mov eax,DWORD PTR myWords                ; h. EAX =003B008A
mov esi,myPointer
mov ax,[esi+2]                           ; i. AX =0000
mov ax,[esi+6]                           ; j. AX =0000
mov ax,[esi-4]                           ; k. AX =0044
mov al,var1                              ; l. AL=FC
mov ah,[var1+3]                          ; m. AH=01
mov ax,[var2+4]                          ; n.  AX=3000
mov ax,var3                              ; o.  AX=FFF0
mov ax,[var3-2]                          ; p.  AX=4000

mov ax,var2                              ; q. AX=1000
mov edx,var4                             ; r. EDX=00000001
movzx edx,var2                           ; s. EDX=00001000
mov edx,[var4+4]                         ; t. EDX=00000002
movsx edx,var1                           ; u. EDX=FFFFFFC
```