EE213 Computer Organization and Assembly Language
Quiz I (Section B | D) – Fall 2018
September 24th, 2018
Paper-A Solution

Answer the following questions.

1. Elaborate how the following task is achieved by computer (*your answer should be limited to memory and registers for this purpose and busses*). **(2 Points)**

```
ADD [12FCBD10h], AL
```

FREE RESPONSE QUESTION

2. Given the code snippet below, fill in the register value/status of FLAGS where indicated:**(3 Points)**

```
1. 295100F7h    MOV AL, 0FFh    ;EIP: 95100F8h

2. 295100F8h    MOV BL, 0Ah
3. 295100F9h    MOV CL, 14h
4. 295100FAh    ADD AL, 1       ;CF: 1 OF: 0 ZF: 1 SF: 0

5. 295100FBh    SUB BL,CL       ;CF:1 OF:0 SF: 1 ZF:0
6. 295100FCh    DEC AL
7. 295100FDh    INC BL
8. 295100FEh    INC CL
9. 295100FFh    SUB BL,CL
```

3. Executing the following code snippet, what value will be stored in **EAX**? **(2 Points)**

```
.data
      val64  LABEL  QWORD
      var1   BYTE   12h,13h,14h
      var2   WORD   2 DUP (41h,42h), 2 DUP('AB')
      var3   DWORD  $

.code
      MOV    EAX,DWORD PTR val64
```

A. 42141312h (*41141312h was correct, though, this was closest to answers provided, others even don't make sense*)
B. 14131241h
C. 42411413h
D. 41121314h

4. Assuming that data segment in Question#3, above, starts at **1000FFF9h.** Draw out the byte by byte memory look up with addresses for **var2**. (**4 Points**)

```
var1   BYTE   12h,13h,14h
var2   WORD   2 DUP (41h,42h), 2 DUP('AB')
var3   DWORD  $
```

Answer:

1000 FFFCh	41h	**1001 0004h**	41h ('A')
1000 FFFDh	00	**1001 0005h**	00
1000 FFFEh	42h	**1001 0006h**	42h ('B')
1000 FFFFh	00	**1001 0007h**	00
1001 0000h	41h	**1001 0008h**	41h ('A')
1001 0001h	00	**1001 0009h**	00
1001 0002h	42h	**1001 000Ah**	42h ('B')
1001 0003h	00	**1001 000Bh**	00

Whole data segment may be seen as following, it is also considerable if a student has reserved a single byte for each of 'A' and 'B'

1000 FFF9h	12h	**1001 0001h**	00	**1001 0009h**	00
1000 FFFAh	13h	**1001 0002h**	42h	**1001 000Ah**	42h ('B')
1000 FFFBh	14h	**1001 0003h**	00	**1001 000Bh**	00
1000 FFFCh	41h	**1001 0004h**	41h ('A')	**1001 000Ch**	0Ch
1000 FFFDh	00	**1001 0005h**	00	**1001 000Dh**	00h
1000 FFFEh	42h	**1001 0006h**	42h ('B')	**1001 000Eh**	01h
1000 FFFFh	00	**1001 0007h**	00	**1001 000Fh**	10h
1001 0000h	41h	**1001 0008h**	41h ('A')		

5. With the help of LOOP replace each of the following NEGATIVE elements in **wArray** with its mathematical twice without using MUL, write only the code part: (**5 Points**)

```
wArray    SWORD  1,-2,7,-6,15,-12,25,-20,37,-30
```

SOLUTION**:**

```
.code
   MOV ECX, 5
   MOV ESI, OFFSET [wArray+2]
   L1: MOV AX,[ESI]
   ADD AX, AX
   MOV [ESI], AX
   ADD ESI, 4
   LOOP L1
```