National University of Computer & Emerging Sciences, Karachi
Fall-2020 (CS-Department)
Mid-term Lab Exam (B)

Course Code: EL229	**Course Name:** Computer Organization & Assembly Lang Lab
Instructor Name: Amin Sadiq	
Student ID:	**Section:**
Date: November 05, 2020	**Time:** 120 minutes (1:15PM : 3:15PM)

Instructions:

- Attempt all tasks. All tasks carry different points **Max Points**: 20
- Return the paper after exam
- **Cheating in any case will lead to F-GRADE directly as per university rules.**
- In case of any ambiguity, you may make assumption. But your assumption should not contradict any statement in the question paper

Task 1: (4)

a) Write a program that uses a loop for the first 25 numbers of this sequence.

1, 5, 9, 13, 17...

b) Declare a BYTE array of size 10 having different values of your own choice. Write a program to calculate sum of squares of all elements of that array and store it in the variable having size of 16 bit.

Task 2 (3)

You are hired as an assembly language developer in the multinational company. On the first day of your job, your boss wants to test you on the assembly language. He wants you to perform Armstrong of the given number i.e. 153. He restrict you not to use mul instruction for this program rather than you can use addition and subtraction for this program. He also give you a hint that this 153 is already broken down into three variable like var1=1, var2=5 and var3=3.

Task 3 (3)

Consider the following data declarations of array:

```
.data
myArray    DD  1502,232,148,123,649,129
```

For base Address you have to find out by implementing it then what are contents (Value) and address of the Following symbol in the below table:

Symbols	Address	Value
[myArray+0*2]		
[myArray+(esi*4)-4+2] ; esi=0		
[myArray+7]		
[myArray+edi-0]+2 ; edi = 4		
myArray+16		

Task 4: (3)

Use following array declarations:

```
Array1 DB    11,    22,    33
Array2 DW    135,   195,   210
Array3 DD    1182,  5394,  3013
```

Create one user define procedure to perform addition arrays using ptr operands. First decrement each value of array then perform addition in between the similar indexes of each array elements. Like result1= Array1[0] + Array2 [0] + Array3[0] & so on.

Task 5: (2)

Give the content of the destination register after the execution of each of the following instructions. If there is any syntax error in the instructions then correct it, when the instructions are:

1.
```
MOV Var2, 7F035816h
MOV bh, BYTE PTR Var2+1
MOV ax, WORD PTR Var2
MOV cl, BYTE PTR Var2+2
```

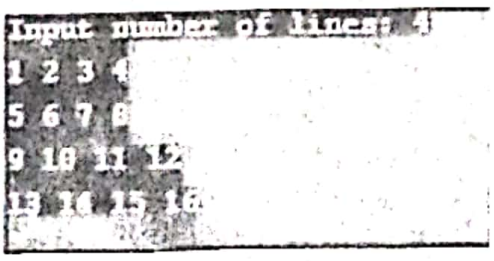
AX=_____ AL=_____ AH=_____
CX=_____ CL=_____ CH=_____
DX=_____ DL=_____ DH=_____

2.
```
MOV Var2,103A8B91h
MOV dl, BYTE PTR Var2+3
MOV eax, DWORD PTR Var2
MOV cx, BYTE PTR Var2+3
```

AX=_____ AL=_____ AH=_____
CX=_____ CL=_____ CH=_____
DX=_____ DL=_____ DH=_____

Task 6: (5)

Using a nested loop create a program for the given output which is attached below.



Use 2 different arrays to move these values in arrays like first two lines to be move in first array, last two line to be move in second array & so on. Use of type, lengthof and sizeof operation is mandatory.