FAST NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES,

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***Computer Organization & Assembly Language* (EE 2003)**

Total Points: 40 Deadline: *12 October, 2023*

Note : 1. Attempt *all* questions.

Assignment 01

Q. No. 1. Answer the following questions: [20 Points]

I. Explain the contents of Segment registers in Real memory addressing mode and Protected mode.

II. Why does memory access take more machine cycles than register access?

III. Write down the name of two types of applications that would be better suited to assembly language than a high-level language.

IV. Describe the execution cycle of an instruction of a computer program, mention the registers and counters involved alongwith their functions.

V. What is the difference between a machine cycle and an instruction cycle?

VI. A major feature of the Java language is that compiled programs run on nearly any computer system. Why?

VII. Elaborate how the following task is achieved by a computer (Limit your answer to memory, registers and buses).
ADD [12FCBD10h], AL

VIII. Which of the following instructions are illegal (if any, describe its reason)?

```
(A)   MOV 2020h, AL           ;Reason:

(B)   MOVZX AX, BX            ;Reason:

(C)   MOV AL, WORD PTR [EBX]  ;Reason:

(D)   ADD [AL], [CH]          ;Reason:

(E)   INC 1Ah                 ;Reason:
```

IX. How many bytes are contained in the following declaration?

```
Var WORD "AB", ABh, 20 DUP(10 DUP("AB"), 10 DUP(ABh), "AB", ABh)
```

X. Give the contents of the status flags C, O, S and Z and the content of destination register after the execution of each of the following sequence of instructions:

```
(A)         MOV AX, 8F7AH
            ADD  AX, 7AF8H

(B)         MOV  BX, 0FA77H
            INC BX
```

Q. No. 2 Find the missing value (directed by "?"); [5 Points]

I. Segment: 560E h
   Offset: 53D9 h
   Real Address: ?
II. Segment: 0893 h
   Offset: ?
   Real Address: BC893 h
III. Segment: ?
   Offset: 50AD h
   Real Address: ED32D h

Q. No. 3 Write assembly language code for the following: [15 Points]

I. Write a code snippet to exchange the values of two variables defined as 'A' and 'B'.
II. Write assembly language code that directly exchanges respective elements of two word sized arrays X1 and X2 having 20 elements each. Your code should not use a third array.
III. Write an assembly language program that sums an array of 100 integers of type BYTE. You may assume that the array is defined and initialized. Use LOOP instruction to design the loop.