COMSATS UNIVERSITY ISLAMABAD, Lahore Campus

Department of Computer Engineering

Subject: Microprocessor Systems and Interfacing (CPE342)	**Batch: FA22-BCE-B**
Assignment No. ONE	**Total Marks: 30**
Handed over on: 28th Feb. 2025	**Submission Date: 7th March 2025 (In class)**
Student's Name:	
Registration Number:	

Instructions:

- Provide your solution in the space provided against each problem
- Back side of each leaf is for rough work only
- Submission after the deadline will not be graded
- Do not use lead pencil in your solution

Note: The CPU referred to in this problem sheet is Intel 8086-88.

Problem 1 **10 Marks**

Write an assembly language program that computes the sum of four 16-bit numbers residing in SI, DI, AX, and DX. The sum must be stored in SS.

```
START:
        ADD  SI, DI
        ADC  SI, AX
        ADC  SI, DX
        MOV  SS, SI
        END
```

Problem 2 **10 Marks**

Write an assembly language program that computes the average of all the 16-bit numbers found in all the segment registers. The result must be stored in SP. Use minimum number of instructions.

```
MOV  AX, CS
MOV  BX, DS
MOV  CX, ES
MOV  DX, SS
ADD  AX, BX
ADC  AX, CX
ADC  AX, DX
MOV  DL, 4
IDIV DL
MOV  SP, AX
END
```

Problem 3 **10 Marks**

Write an assembly language program that complements the bits with bit number 0, 1, 3, 5, 11 and 14 of the words stored at 52A8H:4122H, AB44H:C23FH and 7CD0H:B234H. Make use of a subroutine named "BIT_MASK".

```
            JMP  START

BIT_MASK:
            XOR [BX], 482BH
            RET

START:
            MOV  BX, 52A8H
            MOV  DS, BX
            MOV  BX, 4122H
            CALL BIT_MASK

            MOV  BX, 0AB44H
            MOV  DS, BX
            MOV  BX, 0C23FH
            CALL BIT_MASK

            MOV  BX, 07CD0H
            MOV  DS, BX
            MOV  BX, 0B234H
            CALL BIT_MASK

            END
```