COE 205, Term 992

Computer Organization & Assembly Programming

HW# 2

Due date: Sat., Feb. 19

Q.1. Show the content of the memory allocated based on the following directives, assuming that the first byte is allocated at address 0000H in the data segment.

```
I    DB    -21, 233
     DW    -21
     DD    -15
J    DB    `12`
     K     EQU   20
     DW    `12`
     DW    offset J
     DB    2 dup (`12`)
```

Q.2. Suppose that you have the following initial content of the registers and memory locations, assuming that variables i and j are defined as byte variables:

AX=0E22H	BX=0001H	CX=01F0H	DX=F1E0H
SI =0016H	DI =0014H	BP=0200H	SP =0300H
DS =2000H	ES =3000H	CS=5F2FH	SS =4000H
IP =E731H			

Memory Address (hex)			Contents (hex)
2000:	i	0010	A1
		0011	E2
		0012	AF
	j	0013	C2
		0014	11
		0015	3C
		0016	5D
		0017	71

(i) Show the contents of the registers and memory locations modified after the execution of each of the following instructions. Use the initial content of the registers and memory locations for the execution of each instruction. Furthermore, specify the addressing modes of the source and destination operands in each instruction.

1. ADD AX, [BX+16]
2. MOV DX, WORD PTR i+2
3. ADD CX, [SI-2]
4. MOV BYTE PTR [BX+DI], -1
5. MOV AX, offset j
6. MOV j, CL

(ii) Determine the starting and ending addresses of the code segment. What is the physical address of the next instruction to be fetched from memory.

(iii) Determine the physical address of the source operand in the following instruction:

```
MOV AX, [BX+DI+1]
```

(iv) Show the contents of AX, BX, and the flags (O,S,Z,A,P, and C) at the end of executing the ADD instruction

```
MOX AX, 7FACH
MOV BX, 7438H
ADD BX, AX
```

(v) Show the contents of AX, BX, and the flags (O,S,Z,A,P, and C) at the end of executing the SUB instruction

```
MOX AX, 6C38H
MOV BX, 72F9H
SUB AX, BX
```

Q.3. Write an 8086 assembly program to prompt the user to enter a 2-digit number and then displays the 2 digits in reverse, i.e., if the user enters the number 29, the program displays the number 92. Use the INT 21H routine for character input, character output, and string output.