Roll No: ---------------------- Section: -----------------------

* It is an open book and open notes exam.
* Write neat and well-commented programs.

**Q1.** In the following code, tell whether the jump will be taken or not. **Show each and every step** to get marks. [Marks 6]

[org 0x100]

mov ax, 0xF193

mov bx, 0x1234

xor ax, 0x195B

cmp ax, bx

jl exit

exit:

mov ax,0x4c00

int 21h

Solution:

Ax=0xF193

Bx=0x1234

After xor ax, 0x19fb

Ax=0xE8C8

Since ax is less than bx and it’s a signed jump hence jump will be taken.

**Q2.** Implement a modulo-3 counter that counts from zero up to 23-1 and then resets to zero, using **no more than two assembly language instructions**. [Marks 6]

Solution:

Inc ax

And ax, 0x0007

**Q3.**Consider the program written below. This program is currently in execution. Current value of CS Register is 0FE2h and the Physical address pointed to by CS:IP is 0FF29. For this program, determine what will be the **current contents** of a) IP register, and b) ax register, given the above CS:IP values. (Suppose size of move instruction is 3 bytes.) [Marks 6]

[ORG 0X100]

MOV AX, 10

MOV AX, 6

MOV AX, 5

MOV AX, 2

MOV AX, 1

MOV AX, 0x4C00

INT 0x21

Solution:

CS=0x0FE2

CS:IP=0x0FF29

IP=0x0FF29-0x0FE20

=0x109

|  |  |
| --- | --- |
| 0100 | MOV AX, 10 |
| 0103 | MOV AX, 6 |
| 0106  IP | MOV AX, 5 |
| 0109 | MOV AX, 2 |
| 10C | MOV AX, 1 |
|  |  |

Hence AX=5

**Q4.** The multiplication algorithm that we did in class works for unsigned numbers. Modify the same algorithm for multiplication of two **8-bits signed numbers.** [Marks 12]

💣🕱 GOOD LUCK 🕱💣