BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE PILANI, Hyderabad Campus
II SEMESTER 2015-2016
CSF241/ECEF241/EEEF241/INSTRF241 MICROPROCESSOR PROGRAMMING AND INTERFACING
TEST I (CLOSED BOOK)
TIME: 60 Min. 29/02/2016 MM: 45

Q1. In an 80386 processor working in real mode (16-bit mode): Assume that: CS =3000_H, ES = 4000_H, DS=$1000_{H,}$ SS =2000_H , ESI= 0000 2222_H , EDI = 0000 3233_H ,EBP = 0000 1111_H , EBX= 0000 3333_H EAX=0000 1450_H , ECX = 0000 1420_H, EDX = 0000 1575_H For the instructions given below determine the following. **(Mention the values only in Hex]** **[3X1+4X3]**

(i) Determine the Physical address of the memory operand used in the following instruction.

a) ADD BX, [BP+SI]
b) MOV [1234_H],CL
c) MOV BP, [BX+120_H]

(ii) Determine the addressing mode and write the machine code for the following instructions.

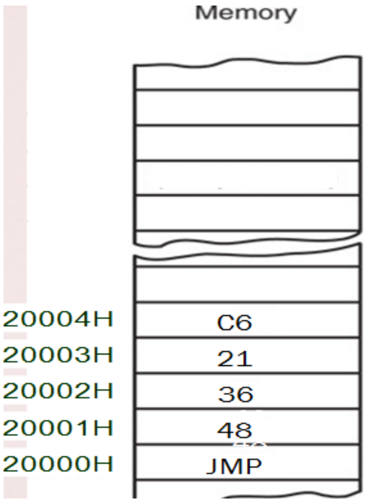
a) MOV ES: [BX], AL
b) MOV AX, [ESI+0400H]
c) MOV BL, 08H
d) MOV CX, [EBX+EDX]

Q2. Replace the following program segments by **a single instruction** of 80386. You can assume that all flags (except Trap and Interrupt) are reset at the beginning of each of these program segment

[Clarification: Each program segment achieves a certain final result. You need to give a single instruction that will achieve the same result. The single instruction needs only achieve the final result. **[8]**

	Program		**Program**
A	**PUSH AX** **PUSHF** **PUSH SI** **POP BX** **POP AX** **OR AX, 0400H** **PUSH AX** **PUSH BX** **POP SI** **POPF** **POP AX**	**B**	**PUSHF** **SUB CL,CL** **MOV CL, BL** **OR BL, FFH** **ROL BL, 01H** **JC L1** **MOV CH, 00H** **L1: MOV CH, FFH** **POPF**
C	**MOV AX, 4567H** **MOV DX,AX** **MOV BL, AL** **MOV CL, AH** **SUB BL, CL** **MOV AL, BL**	**D**	**CMP EAX, EDI** **JE NEXT** **MOV EAX, EDI** **NEXT : MOV EDI, ESI**

Q3. Determine the physical address of the location to where the Jump takes place after the execution of the instruction given in the diagram. [4]



	Memory
20004H	C6
20003H	21
20002H	36
20001H	48
20000H	JMP

Q4. What will be the effect of executing the following code snippet on an 80386 processor? **[4]**

(i)

```
MOV   EBX, FF123400H
BSWAP EBX
```

(ii)

```
MOV AL, 5
MOV BL, 7
MUL  BL
AAM
OR  AX, 3030H
```

Q5. (a) Write a global procedure to add two numbers stored in a consecutive memory locations.

(b**)** Write a MASM program to find out the number of positive numbers and negative numbers from a given series of signed numbers. Store the count of positive numbers and negative numbers in some other locations. **[4+ 10]**

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