ECE3210 Microprocessor Engineering - Practice Exam1

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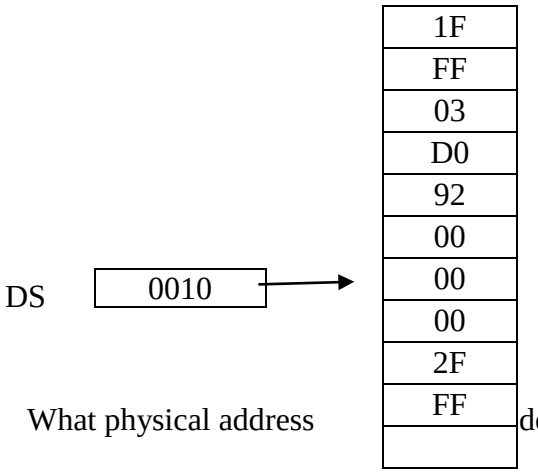
1. (20 pts) Assume the 80386 is running in protected mode with the state given below.

DS = 0010 H

ESI = 00001202

EBP = 0000FC4

Global Descriptor Table



a. What physical address does the following instruction access?

MOV AX, [ESI]

03000000 Base

00001202 [ESI]

03001202H

b. Is memory physical address 06500000H within this segment?
Based on the descriptor, DS segment base is: 03000000H, limit is 02FFFFFFH, so memory address 06500000H is not in this segment. The highest address will be 05FFFFFH

2. (40 points) For each data transfer instruction, list all register final contents, or memory (physical addresses and contents) that are modified. Assume real mode operation. Consider each instruction separately. Use hexadecimal format.

Register initial state:

AX: 0000H BX: 0008H CX: 021EH DX: FF00H
SI: 0002H DI: 0101H DS: 1201H

Memory
Address

12000H	20	13	80	40
12004H	FF	AF	BC	13
12008H	99	88	77	66
1200CH	A8	B1	F0	43
12010H	78	D6	32	33
12014H	23	35	12	26
12018H	83	03	8C	EF
1201CH	FF	A2	C3	00

a. MOV AX, [BX+01H]

AX__038C_____

b. MOV WORD PTR [DI], -6

12010H
0101H
12111H

Memory physical addresses _12111H
Memory contents FFFAH

c. MOV DI, OFFSET [SI + 0A2BH]

DI _0A2DH

d. MOV AL, [BX+SI]

AL ___8C

3. (20 points) Write a program which swaps the contents of two memory variable x and y

```
.data
x    dw   1234h
y    dw   5678h

.code
```

MOV AX, 1234h
MOV BX, 5678h
MOV x, BX
MOV y, AX

.end

4. (20 points)

Assume SP = 0100H. What will be the content of SP, AX, and EBX after executing the following two instructions?

```
POP AX
POP EBX
```

SP__FFH AX___4232H EBX__45H Stack segment is shown below:

Offset Address SP	Value(H)
0108H	99
0107H	12
0106H	45
0105H	3B
0104H	42
0103H	32
0102H	8C
0101H	5B
0100H	FF
00FFH	AC
00FEH	85
00FDH	2D
00FCH	78
00FBH	5B
00FAH	9F
00F9H	1A