

## CS401

### Final Term Examination – Spring 2006

Time Allowed: 150 Minutes

#### Question No. 1

Marks : 1

**Interrupt Flag is set by**

1. Processor
2. Organization
3. Programmer
4. Any one can set

#### Question No. 2

Marks : 3

Explain the purpose and working of the following program. Also, write comments in front of each instruction describing the purpose of that particular instruction.

```
[org 0x0100]
    jmp start

count:  dw 0
attribute:  dw 0x07
second:  dw 0

timer:   push di
         push cx
         push ax
         push es

         inc word[cs:count]
         cmp word[cs:count], 91
         je clrscr
         jmp exit

clrscr:  mov word[cs:count], 0
         mov ax, 0xb800
```

```

        mov es, ax
        xor di, di
        mov al, 0x20

        add word[cs:attribute], 0x10
        cmp word[cs:attribute],
0x77
        jbe next

        mov word[cs:attribute], 0x07

next:    mov ah, [cs:attribute]
        mov cx, 2000
        cld
        rep stosw

exit:    mov al, 0x20
        out 0x20, al

        pop es
        pop ax
        pop cx
        pop di
        iret

start:   xor ax, ax
        mov es, ax
        cli
        mov word[es:8*4], timer
        mov [es:8*4+2], cs
        sti

        mov dx, start
        add dx, 15
        mov cl, 4
        shr dx, cl
        mov ax, 0x3100
        int 0x21

```

### Question No. 3

Marks : 3

Suppose AL contains 11001011b and CF= 1. Give the new contents of AL after each of the following instructions is executed.

Assume the following initial conditions for each part of this question

- SHL AL, 1
- SHR AL, 1
- ROL AL, CL if CL contains 2

- d. SAR AL, CL if CL contains 2
- e. RCR AL, CL if CL contains 3

#### Question No. 4

Marks : 1

**Which flag has a special role in debugging?**

- 1. Sign Flag
- 2. Trap Flag
- 3. interrupt Flag
- 4. Direction Flag

#### Question No. 5

Marks : 1

**Read the following code and tell what will be the final effect on bp value**

```
push bp
mov bp, sp
sub sp, 2
mov bp, sp
pop bp
```

- 1. bp will retain its original value
- 2. Value of sp will move to bp
- 3. Value of bp will be less than sp
- 4. Value of bp will be zero

#### Question No. 6

Marks : 1

**IMUL and IDIV operate on**

- 1. Two's-complement numbers
- 2. One's-complement numbers
- 3. All of the given options
- 4. None of the given options

#### Question No. 7

Marks : 1

**The size of selector register in protected mode is**

- 1. 32 bits
- 2. 24 bits
- 3. 16 bits
- 4. None of the given options

#### Question No. 8

Marks : 1

Answer the following questions:

- Which processor interrupts the system 18.2 times per second? What are some of its practical uses?
- What is difference between the fault and trap exception?
- When a key is pressed on the keyboard, which hardware interrupt is generated?
- When an interrupt handler finishes, how does the CPU resume execution to whatever it was doing before the interrupt was triggered?
- At which address is the interrupt vector for INT 10h stored?

#### Question No. 9

Marks : 1

Write the following descriptors in the format: dd 0x0000FFFF, 0x00CD9A40

- 32 bit nonconforming, readable code segment at level 0, with base at 0x00300000 and a limit of 0x00300000.
- 32 bit writeable data segment at level 2, with base at 0x00B00000 and limit of 10000.

Assume the values for the attributes bits are A=1, AVL=0, P=1, r=0, G=0, D=1, E=0 and B=1.