

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 preceding 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:

- a. Which processor interrupts the system 18.2 times per second? What are some of its practical uses?
- b. What is difference between the fault and trap exception?
- c. When a key is pressed on the keyboard, which hardware interrupt is executed?
- d. When an interrupt handler finishes, how does the CPU resume execution to whatever it was doing before the interrupt was triggered?
- e. 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

- i. 32 bit nonconforming, readable code segment at level 0, with base at 0x00300000 and a limit of 0x0FFFF.
- ii. 32 bit writeable data segment at level 2, with base at 0x00B00000 and limit of 0x10000.

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.