FINALTERM EXAMINATION
Spring 2010
CS401- Computer Architecture and Assembly Language Programming (Session - 2)
Time: 90 min
Marks: 58

For Teacher's Use Only									
Q No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Total**
Marks									
Q No.	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	
Marks									
Q No.	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	
Marks									
Q No.	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	
Marks									
Q No.	**33**	**34**	**35**	**36**					
Marks									

Question No: 1 (Marks: 1) - Please choose one

Suppose AL contains 5 decimal then after two left shifts produces the value as

- ► **5**
- ► 10
- ► 15
- ► 20

Question No: 2 (Marks: 1) - Please choose one

In graphics mode a location in video memory corresponds to a _____ on the screen.

- ► **line**
- ► **dot**
- ► **circle**
- ► **rectangle**

Question No: 3 (Marks: 1) - Please choose one

Creation of threads can be

- ► **static**
- ► **dynamic**
- ► **easy**
- ► **difficult**

Question No: 4 (Marks: 1) - Please choose one

The thread registration code initializes the PCB and adds it to the linked list so that the _____ will give it a turn.

- ► **assembler**
- ► **scheduler**
- ► **linker**
- ► **debugger**

Question No: 5 (Marks: 1) - Please choose one

VESA VBE 2.0 is a standard for

- ► **High resolution Mode**
- ► Low resolution Mode
- ► Medium resolution Mode
- ► Very High resolution Mode

Question No: 6 (Marks: 1) - Please choose one

Which of the following gives the more logical view of the storage medium

- ► BIOS
- ► **DOS**
- ► Both
- ► None

Question No: 7 (Marks: 1) - Please choose one

Which of the following IRQs is derived by a key board?

- ► IRQ 0
- ► **IRQ 1**
- ► IRQ 2
- ► IRQ 3

Question No: 8 (Marks: 1) - Please choose one

Which of the following IRQs is used for Floppy disk derive?

- ► IRQ 4
- ► IRQ 5
- ► **IRQ 6**
- ► IRQ 7

Question No: 9 (Marks: 1) - Please choose one

Which of the following pins of a parallel port connector are grounded?

- ► 10-18
- ► **18-25**
- ► 25-32
- ► 32-39

Question No: 10 (Marks: 1) - Please choose one

The physical address of IDT(Interrupt Descriptor Table) is stored in _____

- ► GDTR
- ► **IDTR**
- ► IVT
- ► IDTT

Question No: 11 (Marks: 1) - Please choose one

In NASM an imported symbol is declared with the ..... while and exported symbol is declared with the .....

- ► Global directive, External directive
- ► **External directive, Global directive**
- ► Home Directive, Foreign Directive
- ► Foreign Directive, Home Directive

Question No: 12 (Marks: 1) - Please choose one

In 68K processors there is a ..... program counter (PC) that holds the address of currently executing instruction

- ► 8bit
- ► 16bit
- ► **32bit**
- ► 64bit

Question No: 13 (Marks: 1) - Please choose one

To reserve 8-bits in memory ___ directive is used.

► **db**
► dw
► dn
► dd

Question No: 14 (Marks: 1) - Please choose one

In the “mov ax, 5” 5 is the _____ operand.

► **source**
► destination
► memory
► register

Question No: 15 (Marks: 1) - Please choose one

RETF will pop the segment address in the

► **CS register**
► DS register
► SS register
► ES register

Question No: 16 (Marks: 1) - Please choose one

For the execution of the instruction “DIV BL”, the implied dividend will be stored in

► **AX**
► BX
► CX
► DX

Question No: 17 (Marks: 1) - Please choose one

When a number is divided by zero ”A Division by 0” interrupt is generated. Which instruction is used for this purpose

► INT 0
► INT 1
► INT 2
► **This interrupt is generated automatically**

Question No: 18 (Marks: 1) - Please choose one

INT 21 service 01H is used to read character from standard input with echo. It returns the result in _____ register.

► **AL**
► **BL**
► **CL**
► **BH**

Question No: 19 (Marks: 1) - Please choose one

BIOS sees the disks as

► logical storage

► **raw storage**
► in the form of sectors only
► in the form of tracks only

Question No: 20 (Marks: 1) - Please choose one

In 9pin DB 9, which pin number is assigned to CD (Carrier Detect) ?

► **1**
► 2
► 3
► 4

Question No: 21 (Marks: 1) - Please choose one

In 9pin DB 9, Signal ground is assigned on pin number

► 4
► **5**
► 6
► 3

Question No: 22 (Marks: 1) - Please choose one

In 9pin DB 9, RI (Ring Indicator) is assigned on pin number

► 6
► 7
► 8
► **9**

Question No: 23 (Marks: 1) - Please choose one

Motorola 68K processors have ..... 23bit general purpose registers.

► 4
► 8
► **16**
► 32

Question No: 24 (Marks: 1) - Please choose one

When two devices in the system want to use the same IRQ line then what will happen?

► An IRQ Collision

► **An IRQ Conflict**

► An IRQ Crash

► An IRQ Blockage

Question No: 25 (Marks: 1) - Please choose one

In the instruction **MOV AX, 5** the number of operands are

► 1
► **2**
► 3
► 4

Question No: 26 (Marks: 1) - Please choose one

Which flags are NOT used for mathematical operations ?

► Carry, Interrupt and Trap flag.
► **Direction, Interrupt and Trap flag.**
► Direction, Overflow and Trap flag.
► Direction, Interrupt and Sign flag.

Question No: 27 (Marks: 2)

How can we improve the speed of multitasking?

Ans:
We can improve the speed of multitasking by changing the frequency of timer interrupt.

Question No: 28 (Marks: 2)

Write instructions to do the following. Copy contents of memory location with offset 0025 in the current data segment into AX.

Ans:

```
Mov ax , [0025]

mov[0fff], ax

mov  ax , [0010]
  mov [002f] , ax
```

Question No: 29 (Marks: 2)

Write types of Devices?

Ans:
There are two types devices used in pc.

1. Input devices(keyboard, mouse,)
2. Output devices.(monitor, printer)

Question No: 30 (Marks: 2)

What dose descriptor 1st 16 bit tell?

Ans:
Each segment is describe by the descriptor like

1. base,
2. limit,
3. and attributes,

it basically define the actual base address.

Question No: 31 (Marks: 3)

List down any three common video services for INT 10 used in text mode.

Ans:
INT 10 - VIDEO - SET TEXT-MODE CURSOR SHAPE
AH = 01h
CH = cursor start and options
CL = bottom scan line containing cursor (bits 0-4)

Question No: 32 (Marks: 3)

How to create or Truncate File using INT 21 Service?

Ans:

INT 21 - TRUNCATE FILE
AH = 3Ch
CX = file attributes
DS:DX -> cs401 filename
Return:
CF = error flag
AX = file handle or error code

Question No: 33 (Marks: 3)

How many Types of granularity also name them?
Ans:
There are three types of granuality :

1. Data Granularity
2. Business Value Granularity
3. Functionality Granularity

Question No: 34 (Marks: 5)

How to read disk sector into memory using INT 13 service?

Ans:

INT 13 - DISK - READ SECTOR(S) INTO MEMORY :

AH = 02h
AL = number of sectors to read (must be nonzero)
CH = low eight bits of cylinder number
CL = sector number 1-63 (bits 0-5)
high two bits of cylinder (bits 6-7, hard disk only)
DH = head number
DL = drive number (bit 7 set for hard disk)
ES:BX -> data buffer

Return:

CF = error flag
AH = error code
AL = number of sectors transferred

Question No: 35 (Marks: 5)

The program given below is written in assembly language. Write a program in C to call this assembly routine.

```
[section .text]
global      swap
swap:       mov  ecx,[esp+4]     ; copy parameter p1 to ecx
            mov  edx,[esp+8]     ; copy parameter p2 to edx
            mov  eax,[ecx]       ; copy *p1 into eax
            xchg eax,[edx]       ; exchange eax with *p2
            mov  [ecx],eax       ; copy eax into *p1
            ret                  ; return from this function
```

Ans:

The above code will assemble in c through this command. Other aurwise error will occur.

Nasm-f win32 swap .asm

This command will generate swap.obj file.

The code for given program will be as follow.

```
#include <stdio.h>
Void swap(int* pl, int* p2);
Int main()
{
    Int a=10,
    Int b= 20;
Print f (“a=%d b=%d\n” , a ,b);

Swap (&a ,&b);

Print f (“a=%d b=%d\n” , a ,b);

System ( “pause”);


Return 0;


}
```

Question No: 36 (Marks: 5)

Write the code of “break point interrupt routine”.

Ans:

Breakpoint interrupts service routine :

```
debugISR:       push bp
                mov  bp, sp          ; ……..to read cs, ip and flags
                push ax
                push bx
                push cx
                push dx
                push si
                push di
                push ds
                push es

        sti                ;…….. waiting for keyboard interrupt
        push cs
        pop  ds            ;…… initialize ds to data segment
```

```
        mov  ax, [bp+4]
        mov  es, ax          ; ……..load interrupted segment in es
        dec  word [bp+2]     ; ……..decrement the return address
        mov  di, [bp+2]      ;…… read the return address in di
        mov  word [opcodepos], di ;……. remember the return position
        mov  al, [opcode]    ; ……..load the original opcode
        mov  [es:di], al     ;…….. restore original opcode there

        mov  byte [flag], 0  ; ……set flag to wait for key
        call clrscr          ;……. clear the screen

        mov  si, 6           ; ……..first register is at bp+6
        mov  cx, 12          ;…… total 12 registers to print
        mov  ax, 0           ; ……..start from row 0
        mov  bx, 5           ; ……print at column 5

    push ax              ; ……..row number
        push bx          ;……. column number
        mov  dx, [bp+si]
        push dx          ;……. number to be printed
        call printnum    ;…….. print the number
        sub  si, 2       ; ……point to next register
        inc  ax          ; ……next row number
        loop l3          ; ……repeat for the 12 registers

        mov  ax, 0       ; ……..start from row 0
        mov  bx, 0       ; ……..start from column 0
        mov  cx, 12      ; ……..total 12 register names
        mov  si, 4       ;……. each name length is 4 chars
        mov  dx, names   ; ……..offset of first name in dx

        push ax          ;……. row number
        push bx          ; ……column number
        push dx          ; ……offset of string
        push si          ; ……length of string
        call printstr    ; ……print the string
        add  dx, 4       ;…….. point to start of next string
        inc  ax          ; ……new row number
        loop l1          ;…….. repeat for 12 register names

        or word [bp+6], 0x0100  ; ……set TF in flags image on stack

keywait:    cmp  byte [flag], 0  ;……. has a key been pressed
        je   keywait         ;  …….. no, check again

        pop es
```

```
        pop ds
        pop di
        pop si
        pop dx
        pop cx
        pop bx
        pop ax
        pop bp
        iret

start:    xor  ax, ax
        mov  es, ax          ;          ……point es to IVT base
        mov  word [es:1*4], trapisr ;…… store offset at n*4
        mov  [es:1*4+2], cs    ;     ……...store segment at n*4+2
        mov  word [es:3*4],          ……..debugisr ; store offset at n*4
        mov  [es:3*4+2], cs    ;     ……..store segment at n*4+2
        cli                  ;          ……disable interrupts
        mov  word [es:9*4], kbisr ; ……store offset at n*4
        mov  [es:9*4+2], cs    ; ……..store segment at n*4+2
        sti                  ;          ……enable interrupts
```