FINALTERM EXAMINATION
Spring 2010
CS401- Computer Architecture and Assembly Language Programming
(Session - 3)

Time: 90 min
Marks: 58

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

SP is associated with……. By default

- ► **SS**
- ► DS
- ► CS
- ► ES

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

Which bit of the attributes byte represents the red component of foreground color

- ► 5
- ► 4
- ► 3
- ► **2**

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

An 8 x 16 font is stored in _____ bytes.

- ► 2
- ► 4
- ► 8
- ► **16**

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

In DOS input buffer, the number of characters actually read on return is stored in _____ byte.

- ► **third**
- ► **fourth**
- ► **first**
- ► **second**

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

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

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

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

In STOSW instruction, when DF is clear, SI is

- ► Incremented by 1
- ► **Incremented by 2**
- ► Decremented by 1

► Decremented by 2

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

Which of the following interrupts is Non maskable interrupt

► **INT 2**
► INT 3
► INT 0
► INT 1

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

Which of the following IRQs is connected to serial port COM 2?

► IRQ 0
► IRQ 1
► IRQ 2
► **IRQ 3**

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

The time interval between two timer ticks is ?

► 40ms
► 45ms
► 50ms
► **55ms**

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 32bit ..... that holds the address of currently executing instruction

► Program counter
► Stack pointer
► **Register**
► Stack

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

Single step interrupt is

- ► Hardware interrupt
- ► **Like divide by zero interrupt**
- ► Like divide by 1 interrupt
- ► Software interrupt

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

Which of the following is NOT true about registers:

- ► Their operation is very much like memory
- ► Intermediate results may also be stored in registers
- ► They are also called scratch pad ram
- ► **None of given options**

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

Types of jump are:

- ► short, near
- ► **short, near, far**
- ► near, far
- ► short, far

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

MS DOS uses ____ display mode.

- ► **Character based**
- ► Graphics based
- ► Numeric based
- ► Console based

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

Which of the following IRQs is derived by a timer device?

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

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

In programmable interrupt controller, which of the following ports is referred as a *control port*.

- ► 19
- ► **20**
- ► 21
- ► 22

Question No: 19 (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: 20 (Marks: 1) - Please choose one

In 9pin DB 9, which pin number is assigned to DSR (DataSet Ready) ?

- ► 4
- ► 5
- ► **6**
- ► 7

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

In 9pin DB 9, which pin number is assigned to TD (Transmitted Data) ?

- ► 1
- ► 2
- ► **3**
- ► 4

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

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

- ► 4
- ► **5**
- ► 6
- ► 3

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

8088 is a .....

- ► **16 bit processor**
- ► 32 bit processor
- ► 64 bit processor
- ► 128 bit processor

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

The table index (TI) is set to _____ to access the GDT (Global Descriptor Table).

- ► 1
- ► **0**
- ► -1
- ► -2

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

VESA(Video Electronics Standards Association) organizes 16 color bits for every pixel in

- ► 5:5:5 format
- ► **5:6:5 format**
- ► 6:5:6 format
- ► 5:6:7 format

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)

Write instruction to allocate space for 32 PCBs.

Ans:
multitasking kernel as a TSR
[org 0x0100]
jmp start

PCB layout:
ax,bx,cx,dx,si,di,bp,sp,ip,cs,ds,ss,es,flags,next,dummy
0, 2, 4, 6, 8,10,12,14,16,18,20,22,24, 26 , 28 , 30

Question No: 28 (Marks: 2)

Define short jump

Ans;
The jump is called a short jump, If the offset is stored in a single byte as in 75F2 with the opcode 75 and operand F2, the jump is called a short jump. F2 is added to IP as a signed byte

Question No: 29 (Marks: 2)

INT 14 - SERIAL - READ CHARACTER FROM PORT uses which two 8bit registers to return the results ?

Ans;

14 - SERIAL - READ CHARACTER FROM PORT uses these two 8bit registers to return the results:

AH = line status

AL = received character if AH bit 7 clear

Question No: 30 (Marks: 2)

Which registers are uses as scratch when we call a function?

Ans:
Following registers are uses as scratch when we call a function

- EAX
- ECX
- EDX

Question No: 31 (Marks: 3)

VESA service **"INT 10 – VESA – Get SuperVGA Information"** uses which registers to return the result?

To return the result, **"INT 10 – VESA – Get SuperVGA Information" uses:**
Return:
AL = 4Fh if function supported
AH = status

Question No: 32 (Marks: 3)

Define the protected mode.

When the processor switches into 32bit mode it is called protected mode. It can be accessed by turning on least significant bit of a register called CR0
(Control Register 0) and the processor switches into 32bit mode.
All registers in 386 have been extended to 32bits. The new names are
EAX,
EBX,
ECX,
EDX,
ESI,
EDI,
ESP,
EBP,
EIP, and
EFLAGS.
The original names refer to the lower 16bits of these registers. A 32bit address register can access upto 4GB of memory so memory access has increased a lot.

Question No: 33 (Marks: 3)

Describe briefly INT 3 functionality.

The functionality of INT 3 is this , its Debug Interrupt. The special thing about this interrupt is that it has a single byte opcode and not a two byte combination where the second byte tells the interrupt number which allows it to replace any instruction what soever. It is also used by the debugger.

Question No: 34 (Marks: 5)

Read the passage carefully and choose proper word for each blank space from the list given below .

In descriptors the 32bit base is scattered into different places because of compatibility reasons. The limit is stored in 20 bits but the .....defines that the limit is in terms of bytes of 4K pages therefore a maximum of 4GB size is possible. The ..... must be set to signal that this segment is present in memory. DPL is the descriptor privilege level again related to the protection levels in 386. ..... defines that this segment is to execute code is 16bit mode or 32bit mode. ..... is conforming bit that we will not be using. .....signals that the segment is readable. A bit is automatically set whenever the segment is accessed.

(A bit, C bit, G bit, D bit, P bit , R bit, B bit)

SOLUTION:
In descriptors the 32bit base is scattered into different places because of compatibility reasons. The limit is stored in 20 bits but the .....**G bit**.....defines that the limit is in terms of bytes of 4K pages therefore a maximum of 4GB size is possible. The .....**P bit**..... must be set to signal that this segment is present in memory. DPL is the descriptor privilege level again related to the protection levels in 386. .....**D bit**..... defines that this segment is to execute code is 16bit mode or 32bit mode. .....**C**..... is conforming bit that we will not be using. .....**R bit**.....signals that the segment is readable. A bit is automatically set whenever the segment is accessed.

Question No: 35 (Marks: 5)

Answer the following:

§ What is a device driver?

Ans:

These are operating system extensions which become part of the operating system and extend its services to new devices. Device drivers in DOS are very simple. They just have their services exposed through the file system interface.

Device driver file starts with a header containing a link to the next driver in the first four bytes followed by a device attribute word. The most important bit in the device attribute word is bit 15 which dictates if it is a character device or a block device.

If the **bit is zero** the device is a character device and otherwise a block device.

Next word in the header is the offset of a strategy routine, and then is the offset of the interrupt routine and then in one byte, the number of units supported is stored. This information is padded with seven zeroes.

- Strategy routine is called whenever the device is needed
- it is passed a request header. Request header stores the unit requested, the command
- code, space for return value and buffer pointers etc. Important command codes include
    1. 0 to initialize,
    2. 1 to check media,
    3. 2 to build a BIOS parameter block,
    4. 4 and 8 for read and write respectively.

For every command the first 13 bytes of request header are same.

§ Why are device drivers necessary, given that the BIOS already has code that communicates with the computer's hardware?

Ans:

These are used for the reason of fast programming execution. device driver takes some RAM and expresses it as a secondary storage device to the operating system. Therefore a new drive is added and that can be browsed to, filed copied to and from just like ordinary drives expect that this drive is very fast as it is located in the RAM. This program cannot be directly executed since it is not a user program. This must be loaded by adding the line “device=filename.sys” in the “config.sys” file in the root directory.

Question No: 36 (Marks: 5)

Write the code of “break point interrupt routine”.

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
```

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

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?

Ανσ:
Ωε χαν ιμπροωε τηε σπεεδ οφ μυλτιτασκινγ βψ χηανγινγ τηε φρεθυενχψ οφ τιμερ ιντερρυπτ .

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.

Ανσ:
€
Μοω αξ , [0025]
€
μοω[0φφφ], αξ
€
μοω€αξ , [0010]
€€€μοω [002φ] , αξ

Question No: 29 (Marks: 2)

Write types of Devices?

Ανσ:
Τηερε αρε τωο τψπεσ δεωιχεσ υσεδ ιν πχ.

1. Ινπυτ δεωιχεσ(κεψβοαρδ, μουσε,)
2. Ουτπυτ δεωιχεσ.(μονιτορ, πριντερ)

Question No: 30 (Marks: 2)

What dose descriptor 1st 16 bit tell?

Ανσ:
Εαχη σεγμεντ ισ δεσχριβε βψ τηε δεσχριπτορ λικε

1. βασε,
2. λιμιτ,
3. ανδ αττριβυτεσ,

ιτ βασιχαλλψ δεφινε τηε αχτυαλ βασε αδδρεσσ.

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?
Ανσ:
Τηερε αρε τηρεε τψπεσ οφ γρανυαλιτψ :

1. Δατα Γρανυλαριτψ
2. Βυσινεσσ ζαλυε Γρανυλαριτψ
3. Φυνχτιοναλιτψ Γρανυλαριτψ

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
```

Ανσ:
Τηε αβοϖε χοδε ωιλλ ασσεμβλε ιν χ τηρουγη τηισ χομμανδ. Οτηερ αυρωισε ερ ρορ ωιλλ οχχυρ.
Νασμ–φ ωιν32 σωαπ .ασμ

Τηισ χομμανδ ωιλλ γενερατε σωαπ.οβφ φιλε.
Τηε χοδε φορ γιϖεν προγραμ ωιλλ βε ασ φολλοω.

```
#ινχλυδε <στδιο.η>
ϛοιδ σωαπ(ιντ* πλ, ιντ* π2);
Ιντ μαιν()
{
    Ιντ α=10,
    Ιντ β= 20;
Πριντ φ (  α=%δ β=%δ∴ν   , α ,β);

Σωαπ (&α ,&β);

Πριντ φ (  α=%δ β=%δ∴ν   , α ,β);

Σψστεμ (   παυσε  );


Ρετυρν 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
```

Cs401 2010

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

Which feature of database provides conversion from inconsistent state of DB to a consistent state ensuring minimum data loss?

- ▶ User accessible catalog
- ▶ Data processing
- ▶ Authorization service
- ▶ Recovery service

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

Which of the following statements is true about the views?

- ▶ view is always a complete set of all the tables in a database
- ▶ View can not be used for retrieving data
- ▶ The results of using a view are not permanently stored in the database.
- ▶ Rows can not be updated or deleted in the view

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

Which of the following is true about TRUNCATE?

► Can be Rolled back.

► Activates Triggers.

► is DML Command.

► Resets identity of the table.

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

Which of the following is the correct way to find out the size of cartesian product incase of CROSS JOIN?

► the number of columns in the first table multiplied by the number of columns in the second table.

► the number of columns in the first table multiplied by the number of rows in the second table.

► the number of rows in the first table multiplied by the number of columns in the first table.

► the number of rows in the first table multiplied by the number of rows in the second table.

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

Suppose there are 8 rows and 4 columns in TABLE1 and 3 rows and 4 coulmns in TABLE2; what is the size of the cartesian product incase of CROSS JOIN between these two tables?

► 24
► 32
► 12
► 16

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

Which of the following is not one of the properties of Transaction?

► atomicity
► consistency
► redundancy
► durability

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

Which of the following is INCORRECT about VIEWS?

► It is not possible to left out the data which is not required for a specific view.

► A database view displays one or more database records on the same page.

► Views can be used as security mechanisms

► Views are generally used to focus the perception each user has of the database.

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

Each course section is assigned a particular faculty member, and each course section corresponds to a particular course. Conceptually, what is the relationship between faculty and course (not course section).

- ► 1:1
- ► 1:M
- ► M:M
- ► Ternary

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

Which of the following is used to add or drop columns in an existing table?

- ► ALTER
- ► HAVING
- ► SELECT
- ► THEN

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

Which of the following is a correct way of selecting all the columns from a table called PERSONS?

- ► SELECT FROM * Persons
- ► SELECT * FROM Persons
- ► SELECT * WHERE Persons
- ► SELECT WHERE * Persons

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

Which of the following is NOT a feature of Indexed sequential files?

- ► Records are stored in sequence and index is maintained.
- ► Dense and nondense types of indexes are maintained.
- ► Track overflows and file overflow areas can not be ensured.
- ► Cylinder index increases the efficiency

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

Consider the given relations *Student* and *Instructor* as given below. Please note that Fname and Lname also denote the First Name and Last Name respectively.

Student

First Name	Last Name
Saman	Perera
Romesh	Dias
Jeeva	Silva
Nadee	Alwis
Kumari	Costa
Geetha	Zoysa
Prasad	Fernando

Instructor

Fname	Lname
Ajith	Gamage
Sujith	Hewage
Saman	Perera
Kasun	Peiris
Romesh	Dias

Which of the following statements is correct with respect to the two relations given above?

► The two relations are not union-compatible since their attribute names differ.
► The two relations are union-compatible since they have the same type of tuples.
► The set operations such as CARTESIAN PRODUCT and DIVISION can be applied on these
two relations.

► To find out the students who are not instructors, it is necessary to perform the operation
Student ÷ Instructor.

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

Which of the following serves as a milestone or reference point in the log file?

► Constraints

► Relations

► Check points

► Transactions identities

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

Which of the following is not true regarding DB transactions?

► A set of database operations that are processed partly
► A database transaction is a logical unit of database operations

► A database transaction must be atomic

► A database transaction must contains the ACID property

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

Which of the following are the general activities, which are performed during the development of application programs?

► Data input programs
► Editing

► Display

► All of given

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

Browser based forms are developed in the following tools EXCEPT

► HTML

► Scripting language

- ► Front Page
- ► Web-based Forms

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

Which of the following is not a form of optical disk?

- ► CD ROM
- ► WORM
- ► Erasable Optical
- ► EEPROM

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

Which of the following is the correct description of *cache hit?*

- ► When data is found in the cache
- ► When data is removed in the cache
- ► The number of times the cache is accessed directly by the processor
- ► When data is lost from the cache

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

In which of the following situations, Clustering is suitable:

- ► Frequently updating
- ► Relatively static
- ► Relatively deletion
- ► Relatively dynamic

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

Only one type of constraint can be enforced in any table by **CREATE** command

- ► True
- ► False

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

Which of the following is disadvantage of **chaining** technique to handle the collisions?

- ► Unlimited Number of elements
- ► Fast re-hashing
- ► Overhead of multiple linked lists
- ► Maximum number of elements must be known

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

Consider the following relation R and its sample data. (Consider that these are the only tuples for the given relation)

EmpNo	DeptNo	ProjNo
1001	01	12
1001	01	13
1002	01	12
1003	01	14

Which of the following statements is NOT correct?

- ► The functional dependency ProjNo -> DeptNo holds over R.
- ► The functional dependency (EmpNo, ProjNo) -> DeptNo holds over R.
- ► The functional dependency DeptNo -> ProjNo holds over R.
- ► The functional dependency EmpNo -> DeptNo holds over R.

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

An entity type is

- ► defined when the database is actually constructed
- ► a specific type such as an integer, text, date, logical etc
- ► a coherent set of similar objects that we want to store data on (e.g. STUDENT, COURSE, CAR)
- ► defined by the database designer

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

An entity can be logically connected to another by defining a _____.

- ► hyperlink
- ► common attribute
- ► primary key
- ► superkey

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

You can’t modify more than one table at a time through a view.

- ► True
- ► False

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

Which of the following is one of the purposes of using DML commands?

- ► Creating databases
- ► Destroying databases
- ► Inserting data in tables
- ► Non of the above

Question No: 27 (Marks: 2)

□□□
□□□□□□□□□□

Question No: 28 (Marks: 2)

Define **domain of an attribute**.

Ans:

Domain is the set of possible values that an attribute can have, that is, we specify a set of values either in the form of a range or some discrete values, and then attribute can have value out of those values. Domain is a form of a check or a constraint on attribute that it cannot have a value outside this set.

Question No: 29 (Marks: 2)

Write the main feature of volatile storage media?

Computer storage that is lost when the power is turned off is called as volatile storage. For example RAM

Question No: 30 (Marks: 2)

Suppose you want to delete a table row by row and record an entry in the transaction log for each deleted row. Which DML command will you use?

DELETE * FROM student WHERE name=”Abrar”;

Question No: 31 (Marks: 3)

Write three benefits of using VIEWS.

Views are generally used to focus, simplify, and customize the perception each user has of the database. Views can be used as security mechanisms by allowing users to access data through the view, without granting the users permissions to directly access the underlying base tables of the view.Views allow users to focus on specific data that interests them and on the specific tasks for which they are responsible. Unnecessary data can be left out of the view. This also increases the security of the data because users

Question No: 32 (Marks: 3)

```
SELECT * FROM Persons
WHERE FirstName LIKE '%da%';
```

what does the above statement return?

Ans:

Question No: 33 (Marks: 3)

What is the difference between a primary key and a unique key with reference to clustered and nonclustered indexes?

Question No: 34 (Marks: 5)

Consider a table named COMPANY with fields COMPANY_NAME,

DESCRIPTION, ORDER_NUMBER. Write an SQL statement to display company names in reverse alphabetical order.

SELECT COMPANY_NAME FROM COMPANY ORDER BY COMPANY_NAME DESC;

Question No: 35 (Marks: 5)

Name the five main components of Database management systems software.

Question No: 36 (Marks: 5)

Give 4 similarities between Materialized views and indexes.

I. They consume storage space.
II. They must be refreshed when the data in their master tables changes.
III. They improve the performance of SQL execution when they are used for
IV. query rewrites.
V. Their existence is transparent to SQL applications and users.

Assembly Language Paper – CS401 Paper attempted : 22 Feb 2010 at 05:00 PM
****

1. BL contains 5 decimal then after right shift , BL will become
   - 3
   - 2.5
   - 5
   - 10

2. 8 * 16 font is stored in _____ bytes.
   - 3
   - 4
   - 8
   - ***16***

3. In DOS input buffer , number of characters actually read on return is stored in
   - First byte
   - ***Second byte***
   - Third byte
   - Fourth byte

4. IRQ 0 has priority
   - Low
   - High
   - ***Highest***
   - Medium

5. Thread registration code initialize PCB and add to linked list so that _____ will give it turn.
   - Assembler
   - Linker
   - ***Scheduler***
   - Debugger

6. Traditional calling conventions are in _____ number
   - 1
   - ***2***
   - 3
   - 4

7. VESA VEB 2.0 is standard for
   - ***High Resolution Mode***
   - Low Resolution Mode
   - Very High Resolution Mode
   - Medium Resolution Mode

8. To clear direction flag which instruction is used
   - ***Cld***
   - Clrd

- Cl df
- Clr df

9. In STOSW instruction , When DI is cleared , SI is

- Incremented by 1
- ***Incremented by 2***
- Decremented by 1
- Decremented by 2

10. Interrupt that is used in debugging with help of trap flag is

- INT 0
- ***INT 1***
- INT 2
- INT 3

11. INT for arithmetic overflow is
- INT 1
- INT 2
- INT 3
- ***INT 4***

12. IRQ referred as

- ***Eight Input signals***
- One Input signal
- Eight Output signals
- One output signal

13. IRQ for keyboard is ____***1***_____

14. IRQ for sound card is _____***5***_____

15. IRQ for floppy disk is _____***6***_____

16. IRQ with highest priority is
- Keyboard IRQ
- ***Timer IRQ***
- Sound Card
- Floppy Disk

17. Pin for parallel port ground is
- 10-18
- ***18-25***
- 25-32
- 32-39

18. The physical address of Interrupt Descriptor Table (IDT) is stored in
- GDTR
- ***IDTR***
- IVT
- IDTT

19. Execution of “RET 2” results in?

20. CX register is
    - ***Count register***
    - Data register
    - Index register
    - Base register

21. OUT instruction uses __**AX**____ as source register.

22. IN DB-9 connector the Data Set ready pin is at
    - 5
    - ***6***
    - 7
    - 8

23. If two devices uses same IRQ then there is
    - IRQ collision
    - *IRQ conflict*
    - IRQ drop

24. VESA organizes 16 bit color for every pixel in ratio
    - 5:5:5
    - ***5:6:5***
    - 6:5:6
    - 5:6:7

25. Division by zero is done by which interrupt.
    Interrupt 0.

26. Define Hardware Interrupt & I/O ports (5 marks)

27. Five BIOS video services used in text mode (3 marks)

INT 10 - VIDEO - SET TEXT-MODE CURSOR SHAPE
AH = 01h
CH = cursor start and options
CL = bottom scan line containing cursor (bits 0-4)
INT 10 - VIDEO - SET CURSOR POSITION
AH = 02h
BH = page number
0-3 in modes 2&3
0-7 in modes 0&1
0 in graphics modes
DH = row (00h is top)
DL = column (00h is left)
INT 10 - VIDEO - SCROLL UP WINDOW
AH = 06h
AL = number of lines by which to scroll up (00h = clear entire window)
BH = attribute used to write blank lines at bottom of window
CH, CL = row, column of window's upper left corner
DH, DL = row, column of window's lower right corner
INT 10 - VIDEO - SCROLL DOWN WINDOW
AH = 07h
AL = number of lines by which to scroll down (00h=clear entire window)
BH = attribute used to write blank lines at top of window
CH, CL = row, column of window's upper left corner
DH, DL = row, column of window's lower right corner

INT 10 - VIDEO - WRITE CHARACTER AND ATTRIBUTE AT CURSOR

POSITION
AH = 09h
AL = character to display
BH = page number
BL = attribute (text mode) or color (graphics mode)
CX = number of times to write character

28. DOS allocate memory for program execution and then de-allocate , explain memory management in DOS (10 marks)

An important point to understand here is that whenever a program is executed in DOS all available memory is allocated to it. No memory is available to execute any new programs. Therefore memory must be freed using explicit calls to DOS for this purpose before a program is executed.
Important services in this regard are listed below.

INT 21 - ALLOCATE MEMORY
AH = 48h
BX = number of paragraphs to allocate
Return:
CF = error flag
AX = segment of allocated block or error code in case of error
BX = size of largest available block in case of error

INT 21 - FREE MEMORY
AH = 49h
ES = segment of block to free
Return:
CF = error flag
AX = error code

INT 21 - RESIZE MEMORY BLOCK
AH = 4Ah
BX = new size in paragraphs
ES = segment of block to resize
Return:
CF = error flag
AX = error code
BX = maximum paragraphs available for specified memory block

INT 21 - LOAD AND/OR EXECUTE PROGRAM
AH = 4Bh
AL = type of load (0 = load and execute)
DS:DX -> ASCIZ program name (must include extension)
ES:BX -> parameter block
Return:
CF = error flag
AX = error code
The format of parameter block is as follows.
Offset Size Description
00h WORD segment of environment to copy for child process
(copy caller's environment if 0000h)
02h DWORD pointer to command tail to be copied into child's PSP
06h DWORD pointer to first FCB to be copied into child's PSP
0Ah DWORD pointer to second FCB to be copied into child's PSP
0Eh DWORD (AL=01h) will hold subprogram's initial SS:SP on return
12h DWORD (AL=01h) will hold entry point (CS:IP) on return

There was fill in blanks question with 10 marks. The choice was given at bottom.

29. Serial Port is also accessible via ***I/O*** ports **, COM 1** is accessible via ports 3F8-3FF while ***COM 2*** is accessible via 2F8 -2FF.

The first register at 3F8 is the ***Transmitter*** holding register if written to and the receiver ***buffer*** register if read from.

Other register of our interest include 3F9 whose ***Bit 0*** must be set to enable received data available interrupt and ***Bit 1*** must be set to enable transmitter holding register empty interrupt.
(Transmitter , COM 1, I/O ports , COM2. bit 0 , Buffer , 3FA)

FINAL TERM EXAMINATION SPRING 2010
CS401 COMPUTER ARCHITECTURE AND ASSEMBLY LANGUAGE PROGRAMMING
9 AUG 2010

Question No: 1 (Marks: 1) - Please choose one
When a 32 bit number is divided by a 16 bit number, the quotient is of

- **32 bits**
- **16 bits**
- **8 bits**
- **4 bits**

Question No: 2 (Marks: 1) - Please choose one
In the instruction MOV AX, 5 the number of operands are

- **1**
- **2**
- **3**
- **4**

Question No: 3 (Marks: 1) - Please choose one
3. In DOS input buffer , number of characters actually read on return is stored in

- **First byte**
- **Second byte**
- **Third byte**
- **Fourth byte**

Question No: 4 (Marks: 1) - Please choose one
7. VESA VEB 2.0 is standard for

- **High Resolution Mode**
- **Low Resolution Mode**
- **Very High Resolution Mode**
- **Medium Resolution Mode**

Question No: 5 (Marks: 1) - Please choose one
22. IN DB-9 connector the Data Set ready pin is at

- **5**
- **6**
- **7**
- **8**

Question No: 6 (Marks: 1) - Please choose one
Threads can have function calls, parameters and _____variables.

- **global**
- **local**

- **legal**
- **illegal**

Question No: 7 (Marks: 1) - Please choose one
How many prevalent calling conventions do exist

- **1**
- **2**
- **3**
- **4**

Question No: 8 (Marks: 1) - Please choose one
In 9pin DB 9 DSR is assigned on pin number

- **4**
- **5**
- **6**
- **7**

Question No: 9 (Marks: 1) - Please choose one
In 9pin DB 9 CTS is assigned on pin number

- **6**
- **7**
- **8**
- **9**

Question No: 10 (Marks: 1) - Please choose one
In 9pin DB 9 CD is assigned on pin number

- **1**
- **2**
- **3**
- **4**

Question No: 11 (Marks: 1) - Please choose one
A 32bit address register can access upto .....of memory so memory access has increased a lot.

- **2GB**
- **4GB**
- **6GB**
- **8GB**

Question No: 12 (Marks: 1) - Please choose one
in device attribute word which of the following bit decides whether it is a charater device or a block device

- **Bit 12**
- **Bit 13**
- **Bit 14**
- **Bit 15**

Question No: 13 (Marks: 1) - Please choose one
9. Which of the following IRQ is cascading interrupt

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

Question No: 14 (Marks: 1) - Please choose one
Which of the following interrupts is used for Arithmetic overflow

- **INT 1**
- **INT 2**
- **INT 3**
- **INT 4**

Question No: 15 (Marks: 1) - Please choose one
An End of Interrupt (EOI) signal is sent by

- **Handler**

- **Processor**

- IRQ
- PIC

Question No: 16 (Marks: 1) - Please choose one
The number of pins in a parallel port connector are?

- 20
- 25
- 30
- 35

Question No: 17 (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: 18 (Marks: 1) - Please choose one
A 32bit address register can access upto ..... of memory so memory access has increased a lot.

- 2GB
- 4GB
- 6GB
- 8GB

Question No: 19 (Marks: 1) - Please choose one
9 Pin Serial connector is called

- DB-7
- DB-9
- DB-25
- 9DB-5

Question No: 20 (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: 21 (Marks: 2)
Write brief about INT 13 – Extended READ SERVICES

Question No: 22 (Marks: 2)
What is Interrupt flag?

Question No: 23 (Marks: 3)
Give the name of any two descriptors

Question No: 24 (Marks: 3)
It is the part of Multitasking TSR caller, what will do these instructions comment against them (3)

```
Mov al, [chars+bx]
Mov [es:40],al
Inc bx
```

Question No: 25 (Marks: 5)
Write Data Movement and Arithmetic Instructions of Motorola 68 K Processor.

Question No: 26 (Marks: 5)
Write assembly program for "Break Interrupt Service Routine"

NOTE
MUST PREPARE LAST 10 LESSONS WELL. MOSTLY THE PAPER WAS FROM THEIR. ESPECIALLY LAST THREE LESSONS.

Today's CS401 Exam

final 2010 spring

REPLIED BY: MALIK RIZWAN ALI

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

The physical address of the stack is obtained by

► SS:SI combination

► **SS:SP combination**

► ES:BP combination

► ES:SP combination

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

Value of AH in the write Graphics pixel service is

► 0Ch

► 0Bh

► 1Ch

► 2Ch

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

Threads can have function calls, parameters and _____ variables.

► global

► local

► legal

► illegal

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

Creation of threads can be

► static

► dynamic

► easy

► difficult

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

How many prevalent calling conventions do exist

► 1

► 2

► 3

► 4

Question No: 6 (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: 7 (Marks: 1) - Please choose one

The serial port connection is a ---------- connector

► 9pin DB 9

► 8pin DB 9

► 3pin DB 9

► 9pin DB 5

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

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

► BIOS

► DOS

► Both

► None

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

In STOSB instruction, when DF is clear, SI is

► Incremented by 1

► Incremented by 2

► Decremented by 1

► Decremented by 2

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

After the execution of STOSW the CX will be

► Decremented by 1

► Decremented by 2

► Incremented by 1

► Incremented by 2

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

IRQ is referred to

► Eight input signals

► One output signal

► One input signals

► Eight output signals

Question No: 12 (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: 13 (Marks: 1) - Please choose one

Which of the following IRQs is connected to serial port COM 1?

► IRQ 4

► IRQ 5

► IRQ 6

► IRQ 7

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

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

► GDTR

► IDTR

► IVT

► IDTT

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

Assembly language is:

► Low-level programming language

► High-level programming language

► Also known as machine language

► Not considered closer to the computer

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

The number of bits required to access 1MB of memory are

► 16 bits

► 32 bits

► Depends on the processor architecture

► 20 bits

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

In STOSB instruction, SI is decremented or incremented by

► 3

► 2

► 1

► 4

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

In programmable interrupt controller, which of the following ports is referred as a control port.

► 19

► 20

► 21

► 22

Question No: 19 (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: 20 (Marks: 1) - Please choose one

In device attribute word, which of the following bit decides whether it is a character device or a block device

► Bit 12

► Bit 13

► Bit 14

► Bit 15

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

In 9pin DB 9, which pin number is assigned to CTS (Clear To Send) ?

► 6

► 7

► 8

► 9

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

In 9pin DB 9, which pin number is assigned to RD (Received Data) ?

► 1

► 2

► 3

► 4

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

VESA(Video Electronics Standards Association) organizes 16 color bits for every pixel in

► 5:5:5 format

► 5:6:5 format

► 6:5:6 format

► 5:6:7 format

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

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

► 4

► 8

► 16

► 32

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

Programmable Interrupt Controller (PIC) has

► One input signals and eight output signals

► One input signal and one output signal

► Eight input signals and one output signals

► Eight input signals and eight output signals

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

Video services are classified into..... broad categories.

► 5

► 4

► 3

► 2

Question No: 27 (Marks: 2)

What are device drivers? give your answer in two to three lines.
Device drivers are operating system extensions that become part of the operating system and extend its services to new devices. Device drivers in DOS are very simple. They just have their services exposed through the file system interface.
Device driver file starts with a header containing a link to the next driver in the first four bytes followed by a device attribute word. The most important bit in the device attribute word is bit 15 which dictates if it is a character device or a block device. If the bit is zero the device is a character device and otherwise a block device. Next word in the header is the offset of a strategy routine, and then is the offset of the interrupt routine and then in one byte, the number of units supported is stored. This information is padded with seven zeroes.
Strategy routine is called whenever the device is needed and it is passed a request header. Request header stores the unit requested, the command code, space for return value and buffer pointers etc. Important command codes include 0 to initialize, 1 to check media, 2 to build a BIOS parameter block, 4 and 8 for read and write respectively. For every command the first 13 bytes of request header are same.

Question No: 28 (Marks: 2)

For what purpose "INT 1" is reserved ?
INT 1 vector occupies location 4,
5, 6, and 7 INT 1, Trap, Single step Interrupt
This interrupt is used in debugging with the trap flag. If the trap flag is set the Single Step Interrupt is generated after every instruction. By hooking this interrupt a debugger can get control after every instruction and display the registers etc. 8088 was the first processor that has this ability to support debugging.

Question No: 29 (Marks: 2)

How interrupts are handled in protected mode.
Switching processor in the newer 32bit mode is a very easy task. Just turn on the least significant bit of a new register called CR0 (Control Register 0) and the processor switches into 32bit mode called protected mode. However manipulations in the protected mode are very different from those in the read mode. Handling interrupts in protected mode is also different. Instead of the IVT
at physical address 0 there is the IDT (interrupt descriptor table) located at physical address stored in IDTR, a special purpose register. The IDTR is also a 48bit register similar in structure to the GDTR and loaded with another special instruction LGDT.

Question No: 30 (Marks: 2)

Which bit of acknowledge is used to generate IRQ7
Pin 10,
the ACK pin, is normally used by the printer to acknowledge the receipt of data and show the willingness to receive more data. Signaling this pin generates IRQ 7 if enabled in the PIC and in the parallel port controller. Pin 18-25 are ground and must be connected to the external circuit ground to provide the common reference point otherwise they won’t understand each other voltage levels.

Question No: 31 (Marks: 3)

Write the name three flags which are not used for mathematical operations.
The three flags not used
for mathematical operations are the direction flag, the interrupt flag and the
trap flag.

Question No: 32 (Marks: 3)

"INT 13 - DISK - GET DRIVE PARAMETERS " uses which registers to return error flag and error number.
INT 13 - DISK - GET DRIVE PARAMETERS
AH = 08h
DL = drive (bit 7 set for hard disk)
Return:
CF = error flag
AH = error code

Question No: 33 (Marks: 3)

Who is responsible for removing the parameter from the stack when we call a function in C and Pascal?

In C the caller removes the parameter while in Pascal the callee removes
them. The C scheme has reasons pertaining to its provision for variable
number of arguments.

Question No: 34 (Marks: 5)

Read the passage carefully and choose proper word for each blank space from the list given below .

In descriptors the 32bit base is scattered into different places because of compatibility reasons. The limit is stored in 20 bits but the .....defines that the limit is in terms of bytes of 4K pages therefore a maximum of 4GB size is possible. The ..... must be set to signal that

this segment is present in memory. DPL is the descriptor privilege level again related to the protection levels in 386. ..... defines that this segment is to execute code is 16bit mode or 32bit mode. ..... is conforming bit that we will not be using. .....signals that the segment is readable. A bit is automatically set whenever the

segment is accessed.

(A bit, C bit, G bit, D bit, P bit , R bit, B bit)

Question No: 35 (Marks: 5)

Write assembly language instructions to set the timer interrupt frequency at 1 ms.

Question No: 36 (Marks: 5)

In the context of " INT 13 - DISK - WRITE DISK SECTOR(S)" fill the blanks by choosing the correct answer against each blank space from the list given at the bottom.

AH = ...

AL = ...

CH = ...

CL = sector number 1-63 (bits 0-5)

high two bits of cylinder (bits 6-7, hard disk only)

DH = ...

DL = drive number (bit 7 set for hard disk)

ES:BX -> .....