

Current Paper
FINAL TERM EXAMINATION
Fall 2022

CS401 - Computer Architecture and Assembly Language programming

Time: 90 min
Marks: 60

Question No: 1 (Marks: 01) - Please choose the correct option

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

Assembler

Scheduler (Page 141)

linked

Debugger

2. VESA VBE 2.0 is a standard for

High resolution Mode (Page 180)

Low resolution Mode

Medium resolution Mode

Very High Resolution Mode

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

GDTR

IDTR (Page 182)

IVT

IDTT

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

10-18

18-25 (Page 125)

25-32

32-39

// extra

pin 2 to pin 9: takes data from the processor

Pin 10: ACK pin, used by printer

pin 18 -25: are ground

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

8bit

16bit

32bit (Page 191)

64bit

6. INT 21 service..... is used to read character from standard input with echo. It returns the result in **AL Register**.

- ▶ 01H
- ▶ 04H
- ▶ 03H
- ▶ 02H

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

- ▶ 4
- ▶ 8
- ▶ 16 (Page 183)
- ▶ 32

8. Value of AH in the write Graphics pixel service is

- ▶ 0Ch (Page 144)
- ▶ 0Bh
- ▶ 1Ch
- ▶ 2Ch

// extra yaad krny ky lya....maybe ap ko is ma sy koi puch lain

INT 13 - DISK - RESET DISK SYSTEM

AH = 00h

Page # 148(Topic: Storage Access By Using BIOS)

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

AH = 02h

INT 13 - DISK - WRITE DISK SECTOR(S)

AH = 03h

INT 13 - DISK - GET DRIVE PARAMETERS

AH = 08h

INT 13 - INT 13 Extensions - EXTENDED READ

AH = 42h

INT 13 - INT 13 Extensions - EXTENDED WRITE

AH = 43h

INT 21 - READ CHARACTER FROM STANDARD INPUT, WITH ECHO

AH = 01h

INT 21 - WRITE STRING TO STANDARD OUTPUT

AH = 09h

INT 21 - BUFFERED INPUT

AH = 0Ah

INT 10 - VIDEO - WRITE GRAPHICS PIXEL

AH = 0Ch

INT 10 - VIDEO - GET FONT INFORMATION

AH = 1130h

INT 10 - TEXT-MODE CHARGEN

AH = 1110h

INT 10 - VIDEO - SET VIDEO MODE

AH = 00h

---> Some common video modes include 40x25 text mode (mode 0), 80x25 text mode (mode 2), 80x50 text mode (mode 3), and 320x200 graphics mode (mode D).

INT 10 - VIDEO - SET TEXT-MODE CURSOR SHAPE

AH = 01Ah

INT 10 - VIDEO - SET CURSOR POSITION

AH = 02Ah

INT 10 - VIDEO - SCROLL UP WINDOW

(ya bhi aya tha mujhy)

AH = 06Ah

INT 10 - VIDEO - SCROLL DOWN WINDOW

AH = 07Ah

INT 10 - VIDEO - WRITE CHARACTER AND ATTRIBUTE AT CURSOR POSITION

AH = 09Ah

INT 10 - VIDEO - WRITE CHARACTER ONLY AT CURSOR POSITION

AH = 0Ah

INT 10 - VIDEO - WRITE STRING

AH = 13h

9. A standard floppy disk has 80 tracks and 18 sectors per track with two heads, one on each side totalling to 2880 sectors or 1440 KB of data. Each sector holds bytes of data.

- ▶ 512 (Page 144)
- ▶ 1024
- ▶ 2068
- ▶ 128

10. In DOS input buffer format, holds the number of characters actually read on return.

- ▶ first byte
- ▶ second byte
- ▶ third byte
- ▶ forth byte

// extra to learn

DOS input buffer format:

first byte:

stores maximum characters buffer can hold.

second byte:

Holds number of characters actually read on return.

11. 16-bit color using EDOR (Extended Display Output Representation) bits is:

▶ 5:5:5

▶ 5:6:5

▶ 6:5:6

▶ 5:5:6

12. INT 10 -VIDEO -SCROOL UP WINDOW

Audio

Video

INT 10h is the BIOS interrupt for video services.

Graphic

Numeric

13. Interrupt for breakpoint (used in debugging) is:

INT13

INT 10

INT 21

INT 11

Extra:

- **INT 13** – Disk services
- **INT 10** – Video services
- **INT 21** – DOS services
- **INT 11** – Equipment list

14. In STOSB instruction, when DF is clear, SI is

▶ Incremented by 1 (Page 92)

▶ Incremented by 2

- ▶ Decrement by 1
- ▶ Decrement by 2

15. After the execution of STOSW the CX will be

- ▶ Decrement by 1 (Page 92)
- ▶ Decrement by 2
- ▶ Increment by 1
- ▶ Increment by 2

16. In 8088, the physical memory address for Interrupt Vector Table is fixed and the table occupies exactly of memory.

- a. 1 KB
- b. 1 MB
- c. 64 KB
- d. 4 Bytes

➤ **Reference: CS401 Final Term Solved MCQs By JUNAID**
<https://drive.google.com/drive/folders/1AI-q2SHPMjjZeMyDkivYCddUuBD-q3uq?usp=sharing>

^

is file ma sy ay thy kuch baki concept clear kry... |

➤ **Playlist dakhny sy phly ya dakhy :** <https://www.youtube.com/live/ji1-sK7SpI?si=oOj118pqbX2SfBCv>



Youtube Playlist (Lecture No. 7 to 17): https://youtu.be/20VkJ-V-OnE?si=njABtIhFEenMB_-M

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[Next, provide 06 questions each of Marks 03]

Question No: 41 (Marks: 03)

What will happen when we execute the following instruction?

MOV DX, MSG

MOV AH, 9

INT 0X21

Answer

It will display the string pointed to by MSG on the screen, ending at the first \$ character.

Question No: 42 (Marks: 03)

What Assembly code for writing "0xAAA" on the parallel port ?

Answer

To write 0xAAA to the **parallel port** (typically **LPT1** at I/O address 0x378), we need to break the value into **8-bit parts** since the parallel port is **byte-oriented (8-bit)**.

But note: **0xAAA** is a **16-bit value**, and the standard parallel port data register accepts only **8 bits** at a time.

Question No: 43 (Marks: 03)

In the content of Architecture, what do you know about the Downward Compatibility ?

Answer

Downward Compatibility means that a **newer computer system or processor** can still **run programs made for older systems** without any problems.

Question No: 44 (Marks: 03)

Can we increase the speed of multitasking ? If yes,how ?

Answer

Yes, the speed of multitasking can be increased by optimizing **hardware** and **software** components.

multitasking speed can be increased by:

Using a **faster CPU**

Adding **more RAM**

Using an **SSD**

Enabling **multi-core processing**

Optimizing the **OS scheduler**

Reducing background processes

Question No: 45 (Marks: 03)

The function declare in the C++ Language :

```
int increment(int x);
```

Write an assembly language instruction to call this function from any program ?

Answer

push ax ; Push argument x onto the stack
call increment ; Call the function

Question No: 46 (Marks: 03)

What does IVT ? what is the meaning of the “vectored” interrupt in 8088 Architecture?

Answer

IVT stands for Interrupt Vector Table

"Vectored" Interrupt Meaning: A vectored interrupt means the CPU automatically looks up the address of the ISR from the IVT, based on the interrupt number.

[Next, provide 04 questions each of Marks 05]

Question No: 47 (Marks: 05)

Suppose there is a need to read the I/O ports, so we have disabled the currently operational interrupt except “Divide by Zero Interrupt” Briefly why this interrupt active.

Answer:

The **Divide by Zero Interrupt** stays active because it is a **CPU exception**, not a regular hardware interrupt. It **cannot be disabled** and is always active to handle critical errors like division by zero.

Question No: 48 (Marks: 05)

Mention different registers and their corresponding values while initializing the serial port using INT 14.

Answer:

To initialize the serial port using **INT 14h**, Function $AH = 00h$, the registers are:

AH = 00h → Function: Initialize serial port

AL → Serial settings (baud rate, parity, stop bits, data bits)

DX → Port number (0 = COM1, 1 = COM2, etc.)

On return:

AH → Status (0 = success, non-zero = error)

AL → Modem status bits

Example:

$AL = 11100011b$ → 9600 baud, no parity, 1 stop bit, 8 data bits.

Question No: 49 (Marks: 05)

Write any 3 assembly instructions of conditional branch and 2 assembly instructions of program control of Motorola 68k processor.

Answer:

✓ **Three Conditional Branch Instructions (Motorola 68k):**

1. **BEQ** – Branch if Equal
2. **BNE** – Branch if Not Equal
3. **BMI** – Branch if Minus (negative result)

These instructions change the program flow based on condition codes (like zero, negative, carry, overflow).

✓ **Two Program Control Instructions (Motorola 68k):**

1. **JMP** – Jump to address
2. **JSR** – Jump to Subroutine

EXPLANATION :(Not a part of answer)

1 Conditional Branch Instructions – (Condition check kr k jump krna)

Ye instructions CPU ko kehti hain:

"Agar koi condition poori ho rahi hai to code ke kisi aur hisay par jump karo."

Jaise hum kehte hain:

Agar number 0 ke barabar ho to is kaam ko karo.

Example Instructions:

Instruction	Matlab in Simple Urdu
BEQ	Branch if Equal – Agar result 0 hai (barabar ho gaya) to jump karo.
BNE	Branch if Not Equal – Agar result 0 nahin hai to jump karo.
BMI	Branch if Minus – Agar result negative hai to jump karo.

Real-life Example:

```
asm
CMP  D0, D1 ; D0 aur D1 ko compare karo
BEQ  EqualPart ; Agar barabar hain to EqualPart label pe jump karo
```

2 Program Control Instructions – (Program ka flow control karna)

Ye instructions CPU ko kehti hain ke:

"Bagair kisi shart ke, code ke kisi aur part pe chalay jao."
Ya
"Function ya subroutine ko call karo."

Example Instructions:

Instruction	Matlab in Simple Urdu
JMP	Jump – Kisi specific jagah pe program control le jao.
JSR	Jump to Subroutine – Function jese kisi code block ko call karo.

Real-life Example:

```
asm
JSR  PrintName ; PrintName function ko call karo
JMP  LoopStart ; LoopStart label pe jump karo
```

Question No: 50 (Marks: 05)

Matching the column (is ma 2 columns thy aik side yaad hy jis ky agy us ki short definiion accurate match krni thi..).

IRET	
IRQ 0	
Multitasking	
Content Switching	
Debugger Behaviour	

Answer:

IRET – Ends an interrupt, restores previous state.

IRQ 0 – Timer (essential for task switching).

Multitasking – Multiple processes sharing CPU.

Context Switching – Swapping process states.

Debugger Behaviour – Uses INT 3, breakpoints, step execution.

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Best of luck for everything ahead!

May Allah bless you with success, strength, and peace.

Please **remember me in your precious prayers**
and I'll do the same, In Sha Allah.

— *Qalb-e-Momin*