

Victoria University of Bangladesh

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Ans to the Que No 1(A)

Computer Interfacing:

The process of connecting peripherals with the microprocessor for transferring instructions and results is known as interfacing

Examples : Interfacing is not just about cables. RS-232, RS-422, RS-423, RS-485, USB and how interfacing in the PC is organized using I/O ports and interrupts and UARTs

Computer Peripheral:

A computer device, such as a CD-ROM drive or printer, that is not part of the essential computer, i.e., the memory and microprocessor. Peripheral devices can be external -- such as a mouse, keyboard, printer, monitor, external Zip drive or scanner -- or internal, such as a CD-ROM drive, CD-R drive or internal modem. Internal peripheral devices are often referred to as integrated peripherals.

Examples of computer peripheral devices:

Some common input devices include:

- keyboard
- mouse
- touchscreen
- pen tablet
- joystick
- MIDI keyboard
- scanner
- digital camera
- video camera
- microphone

Some common output devices include:

- monitor
- projector
- TV screen
- printer
- plotter
- speakers

Ans to the Que No 1(B)

Interrupt:

An interrupt is used to cause a temporary halt in the execution of program.

Microprocessor responds to the interrupt with an interrupt service routine, which is a short program or subroutine that instructs the microprocessor on how to handle the interrupt.

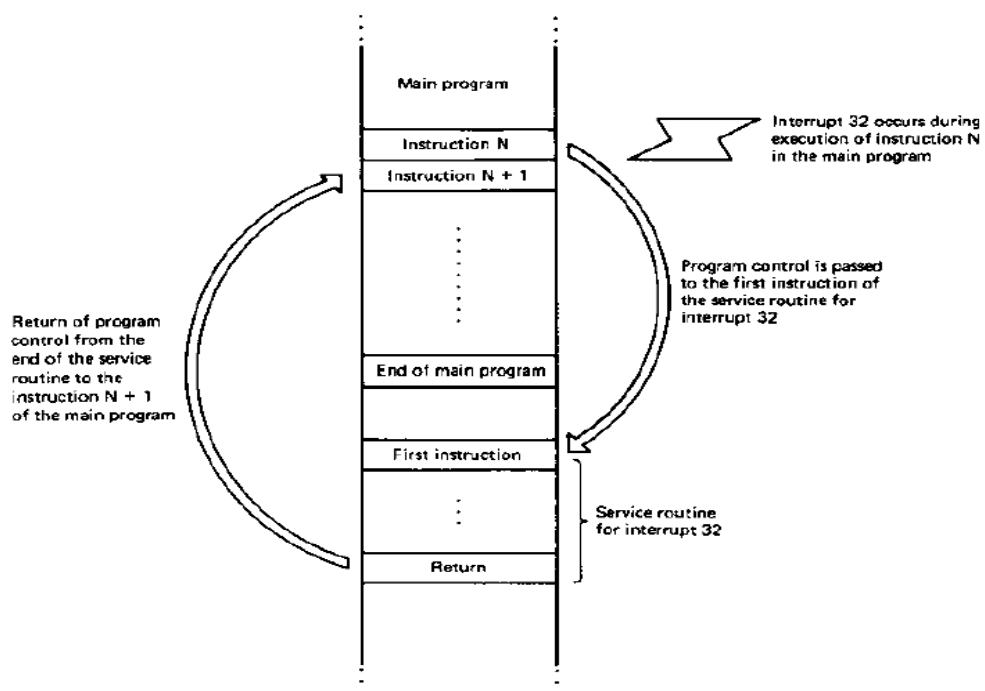
Ans to the Que No 2(A)

Sources of Interrupts

- **Hardware-based Interrupts:**
 - An external hardware applying voltage/signal to the INTR pin (Interrupt pin) of the microprocessor, which indicates that the external device, such as a printer or a keyboard, requires service.
- **Software-based Interrupts:**
 - Execution of the Interrupt instruction, INT.
 - Example:
 - INT type number
- **Internal Interrupts:**
 - Some error condition produced by the execution of an instruction.
 - Example:
 - Divide-by-zero interrupt

Ans to the Que No 2(B)

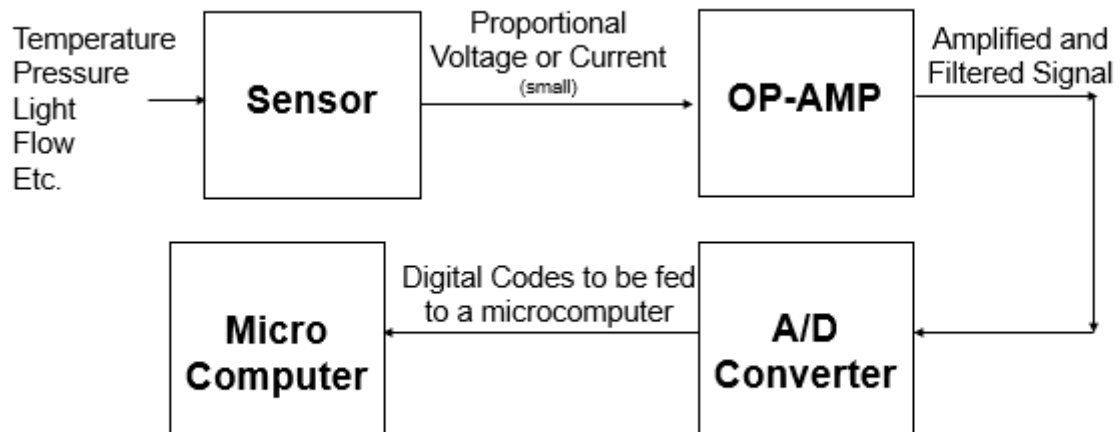
Interrupt program context switching mechanism:



Ans to the Que No 3(A)

Basic Concept of Analog Interfacing :

In order to control the machines in -- Electronics Factory, Medical Instruments, Automobiles etc., We need to determine the values of some variables like pressure, temperature, light, flow etc.



Ans to the Que No 3(B)

Interrupt Vector Table :

- An **interrupt vector table** is stored in the **first 1 kbyte of memory** (starting at address 00000h and ending at 003FFh).
- This is a pointer table to indicate the location of service routines corresponding to interrupt types **0 to 255**.

Memory Address	Table Entry	Vector Definition
3FE	CS 255	Vector 255 ₁₀
3FC	IP 255	
⋮		User Available
82	CS 32	
80	IP 32	Vector 32 ₁₀
7E	CS 31	Vector 31 ₁₀
7C	IP 31	
⋮		Reserved
16	CS 5	
14	IP 5	Vector 5
12	CS 4	Vector 4 — Overflow
10	IP 4	
0E	CS 3	Vector 3 — Breakpoint
0C	IP 3	
0A	CS 2	Vector 2 — NMI
08	IP 2	
06	CS 1	Vector 1 — Single-Step
04	IP 1	
02	CS Value — Vector 0 (CS 0)	Vector 0 — Divide Error
00	IP Value — Vector 0 (IP 0)	

← 2 Bytes →

- Each entry is 4 bytes.
- The CS (Code Segment register) and IP(Instruction Pointer register) in the interrupt vector table indicate the location of the service routine for the corresponding interrupt.
- The lowest five types are dedicated to specific interrupts such as the divide by zero interrupt and the non maskable interrupt.
- The next 27 interrupt types, from 5 to 31 are reserved by Intel for use in future microprocessors.
- The upper 224 interrupt types, from 32 to 255, are available to use for hardware and software interrupts.