

Name : Lagra Adhikary

ID : 2519170011

Course Title : Computer peripherals
and Interfacing

Course Code : CSE-333

①

Answer to the Question-NO-1

① * Computer Interfacing : The process of connecting peripherals with the microprocessor for transferring instructions and results is known as interfacing.

* Computer Peripheral : A peripheral is a device that is used to put information into or get information out of the computer.

•• Three different types of peripherals -

- Input
- Output
- Storage

* Examples of computer peripheral devices -

•• Input devices -

- keyboard
- mouse
- touchscreen
- joystick
- scanner

②

•• Output devices -

- monitor
- projector
- TV screen
- printer
- plotter

There are also devices that function as both input and output devices, such as -

- external hard drives
- media card readers
- digital camcorders
- digital mixers
- MIDI equipment

③

⑥ * Interrupt: An interrupt is used to cause a temporary halt in the execution of program.

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

Answer to the Question NO - 2

① There are 3 types sources of interrupts -

- Hardware-based interrupt
- Software-based interrupt
- Internal interrupt

* Software-based [Interrupts]:

- Execution of the Interrupt instruction INT.
- Example: INT Type number.

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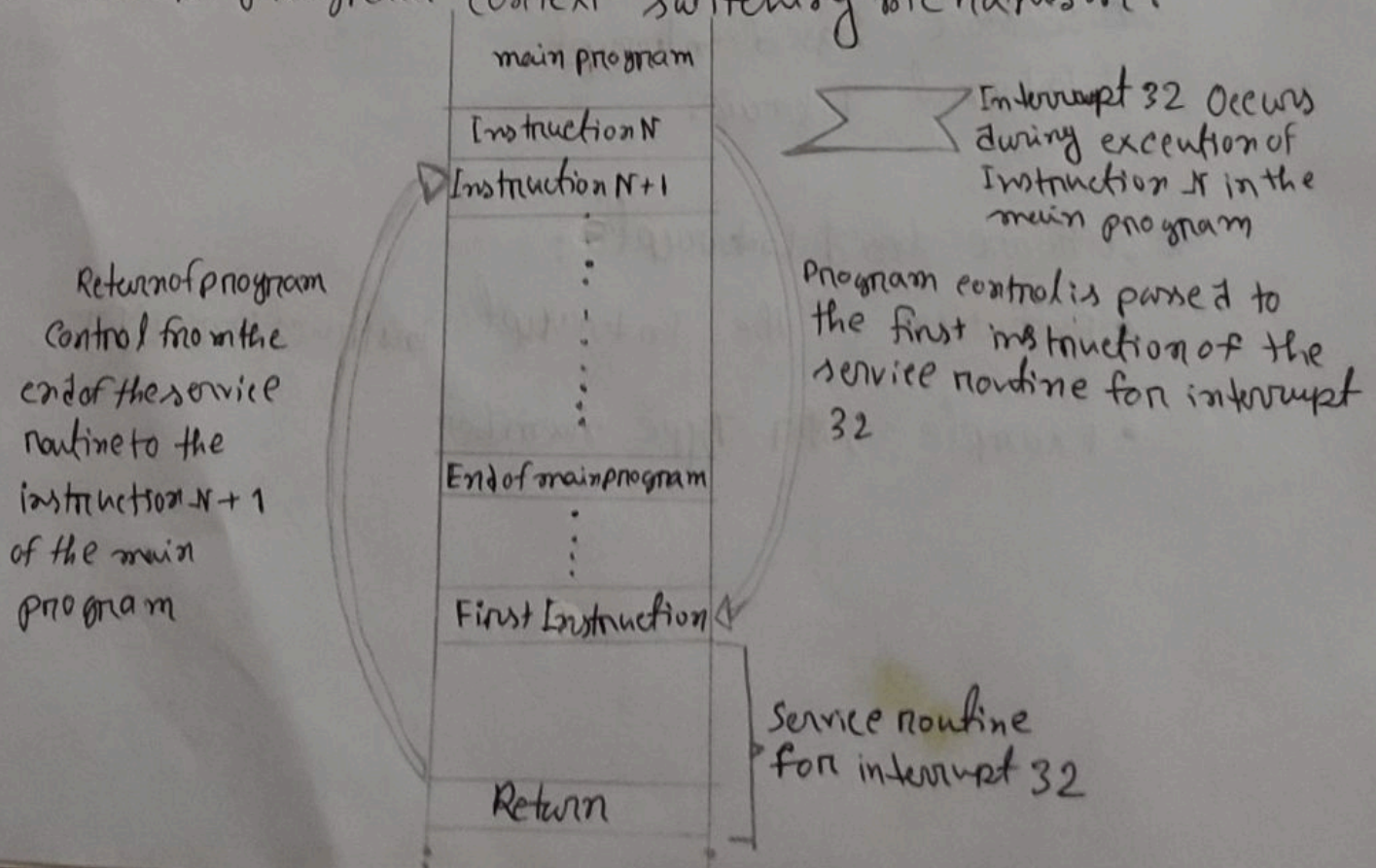
* Internal Interrupts :

- Some error condition produced by the execution of an instruction.
- Example : Divide-by-zero interrupt

* Hardware-based interrupts :

- An external hardware applying voltage/signal to the INTR pin of the microprocessor, which indicates that the external devices, such as a printer or a keyboard, requires service.

⑥ Interrupt program context switching mechanism :



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When the interrupt signal occurs, the MPU must suspend what it is doing in the main part of the program and pass control to a special routine ISR (the interrupt-service routine) that performs the function required by the external device

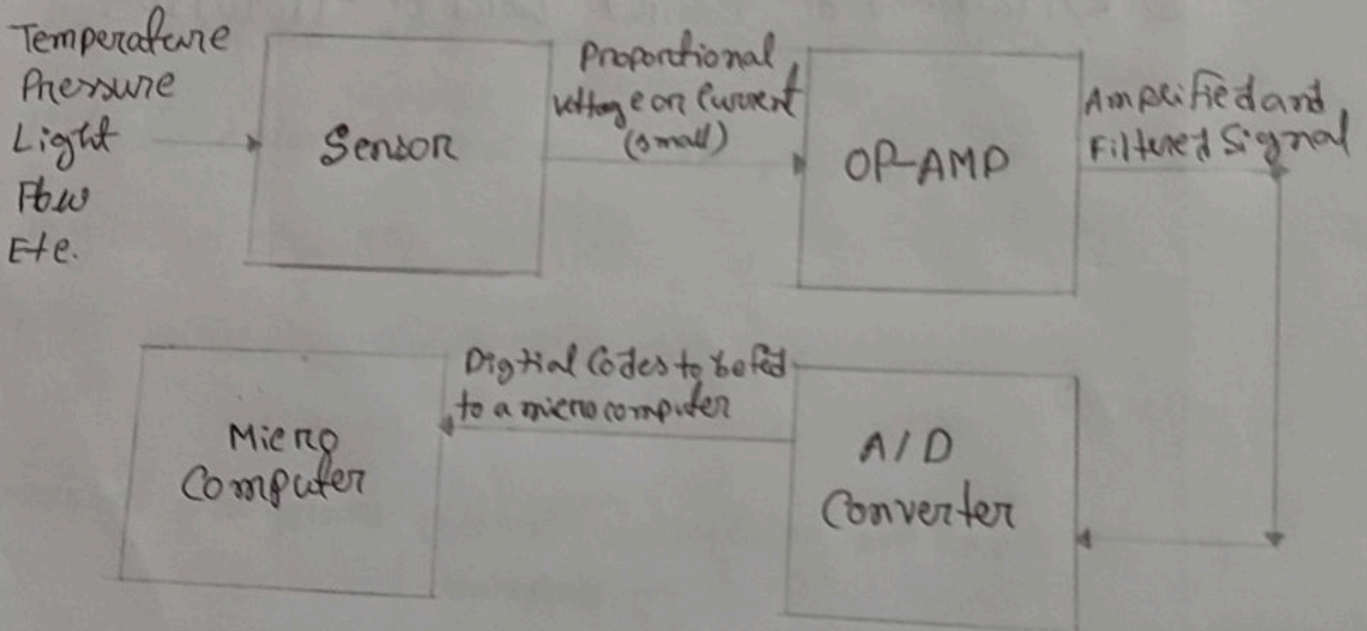
© Explanation of control word of "11010110":

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Answer to the Question 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.



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 ⑧ An interrupt vector table is stored in the first 1Kbyte of memory (starting at address 0000h and ending at 003FFh). This is a pointer table to indicate the location of service routines corresponding to interrupt types 0 to 255.

0 to 255.

Memory Address	Table Entry	vector definition
3FF	CS 255	vector 255,0
3FC	IP 255	
32	CS 32	vector 32,0
30	IP 32	
7E	CS 31	vector 31,0
7C	IP 31	
16	CS 5	vector 5
14	IP 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 →

user Available

Reserved

⑧ Each entry is 4 bytes. The CS and IP 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.

© Since CS_{150} and IP_{150} represent the words of the type 150 interrupt pointer, we get,

$$\text{Address} = 4 \times 150 = 600(10)$$

⑤

converting to binary form gives

$$\text{Address} = 1001011000(2) = 258(16)$$

$$= 0000001001011000(2) = 258(16)$$

Therefore,

IP₁₅₀ is stored at 00258₁₆ and

CS₁₅₀ is stored at