UNIT-III

INTERFACING REQUIREMENTS

Interface is the path for communication between two components. Interfacing is of two types, memory interfacing and I/O interfacing.

Memory Interfacing

When we are executing any instruction, we need the microprocessor to access the memory for reading instruction codes and the data stored in the memory. For this, both the memory and the microprocessor requires some signals to read from and write to registers.The interfacing process includes some key factors to match with the memory requirements and microprocessor signals. The interfacing circuit therefore should be designed in such a way that it matches the memory signal requirements with the signals of the microprocessor.

IO Interfacing

There are various communication devices like the keyboard, mouse, printer, etc. So, we need to interface the keyboard and other devices with the microprocessor by using latches and buffers. This type of interfacing is known as I/O interfacing.

Memory Mapped IO and IO Mapped IO

The microprocessor cannot do anything by itself therefore, It needs to be linked with

memory, extra peripherals, or IO devices. This linking is called Interfacing.

The interfacing of the I/O devices in 8085 can be done in two ways :

 1. *Memory-Mapped I/O Interfacing :*

In this kind of interfacing, we assign a memory address that can be used in the same

manner as we use a normal memory location.

2. I/O Mapped I/O Interfacing :

A kind of interfacing in which we assign an 8-bit address value to the input/output devices which can be accessed using IN and OUT instruction is called I/O Mapped I/O Interfacing.

Difference between Memory-Mapped I/O Interfacing and I/O Mapped I/O Interfacing

Features	Memory Mapped IO	IO Mapped IO
Addressing	IO devices are accessed likeany other memory location.	They cannot be accessed likeany other memory location.
Address Size	They are assigned with 16-bit address values.	They are assigned with 8-bit address values.
Instructions Used	The instruction used are LDAand STA, etc.	The instruction used are IN and OUT.
Cycles	Cycles involved during operation are Memory Read, Memory Write.	Cycles involved during operation are IO read and IO writes in the case of IO Mapped IO.
Registers Communicating	Any register can communicate with the IO device in case of Memory Mapped IO.	Only Accumulator can communicate with IO devices in case of IO Mapped IO.
Space Involved	2^{16} IO ports are possible to be used for interfacing in case of Memory Mapped IO.	Only 256 I/O ports are available for interfacing in case of IO Mapped IO.
IO/M` signal	During writing or read cycles (IO/M` = 0) in case of Memory Mapped IO.	During writing or read cycles (IO/M` = 1) in case of IO Mapped IO.
Control Signal	No separate control signal required since we have unified memory space in thecase of Memory Mapped IO.	Special control signals are used in the case of IO Mapped IO.
Arithmetic and Logical operations	Arithmetic and logical operations are performed directly on the data in the case of Memory Mapped IO.	Arithmetic and logical operations cannot be performed directly on the data in the case of IO Mapped IO.