DMA Transfer → In a hardware with DMA mechanism, peripherals put their data on to their interfaces and get acknowledged. DMA controller now makes a request for granting access of the ESB (Common Bus) by using a line BK. BK takes the request to CPU when CPU grants the access, it makes a line BG at 1.

When BG is 1 DMA controller comes to know that the common bus can be used for transfers. Since it is a parallel processor, it uses all the line needed to read from or write in to the memory it places the address on address line data on input line and when write enable is made 1 the data is transferred to memory. CPU is bypassed here by.

Cycle stealing → By default every transfer is a process and it should be accomplished by a CPU. Programmed I/O and interrupt initiated I/O are the two transfer method in which transfers are performed the same processor that is working for general operations but in DMA we have a separate processor DMA controller for handling transfers. Considering every successful transfer that are handled by DMA are called stolen cycles since CPU is not much involved in these transfer this mechanism is called cycle stealing.
Isolated I/O. Memory mapped I/O: Usually CPU use the same line for r/w as memory chips use. But when some kind of I/O transfer is involved, the scenario gets changed. There may be any of the following two methods.

Memory mapped I/O: In this method every line (input, output, address, read, write) are common for memory transfer & I/O transfer although it makes a burden on the involved line of the common bus. CPU uses time divisions to perform both operation simultaneously.

Isolated I/O: In this method the burden of common bus is reduced by increasing lines.

A CPU in this mechanism uses separate lines of transfer for memory & I/O. Input, output, read & write lines are separate for memory & I/O and this arrangement isolates all I/O transfers from memory transfers. Meanwhile address lines are common to both memory & I/O.
**NOTE:** This content is entirely written, diagrammed and prepared by me [Shashi Kant Mani Tripathi], hence you can write it all in your notes as it is.

**Assignment:**

1. Differentiate between Memory Mapped I/O and Isolated I/O.
2. Briefly describe Interrupt Priority.