UNIT-4

Input / Output System

Introduction:

The I/o devices which are attached to the computer system are called peripheral devices. The most common peripheral devices are - Keyboard, mous, display unit, printer, Scanner, etc.

In most of the data processing activity, a program has to accept input from Keyboard or file from secondary storage device. Therefore the processed data is present in form of output.

The I/o operation refer to a data transfer b/w I/o devices and main memory, or b/w I/o & CPU.

The user program never interact directly with I/o devices. To interact I/o devices, we use routine interact methods. These specialized routines I/o commands are given below —

1) Control
2) Test status
3) Read
4) Write.

Input/output Interface

The degin of logic circuit and written instruction to enable the processor to communicate with peripheral devices is called interfacing and

. The logic circuit is called I/O port or interfacing.

The CPU fetch the inst. from memory, process them and store the result in memory. The main function of I/o interface is to transfer the information b/w CPU or main memory.

Q) Why I/O Device is not directly connected to processor.

Ans Reasons:

i) Variety of peripheral devices with different method of operation are available. So, it would be impractical to incoperate the necessary logic with CPU to control the range of devices.

ii) The data transfer rate of peripheral devices is much slower than memory or CPU.

iii) Generally the peripheral devices used in a computer system have different data format, different data code & word length as compare to CPU used in it.

The I/o interface is divided into Two Categories —

i) I/o Module

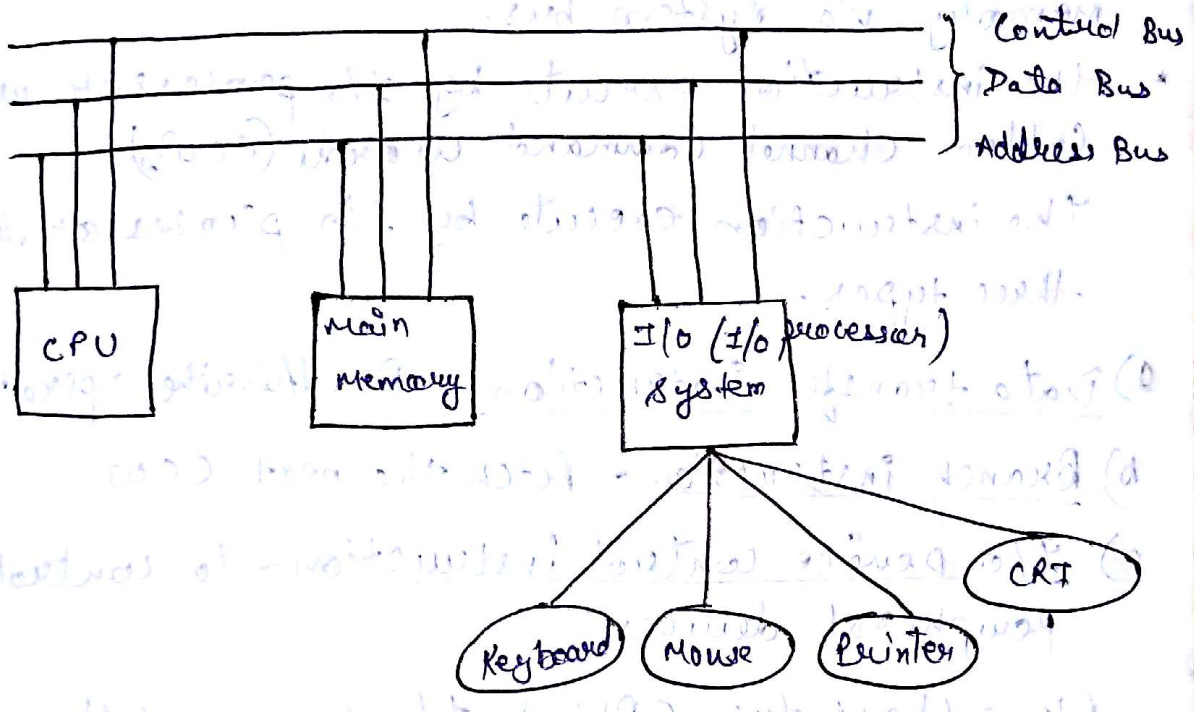
ii) I/o programmed

1) **I/O Module**: The major function of I/O module are -

i) It interface CPU & memory via system bus

ii) It interface one or more device by tailored data link.

The I/O module include a control & timing requirement to coordinate the flow of traffic b/w internal resources & external devices.



I/O Module's Block Diagram

Task of I/O Module:

i) Maintain control & timing signal b/w devices & CPU.

ii) It also maintain CPU communication with devices & main memory.

iii) It also maintain device communication log.

iv) It also maintain data buffering b/w devices & CPU

v) The major task of I/O module is Error detection.

I/O Processor

* It work as a interface b/w devices & CPU.
* It work as a miniprocessor that used to perform only I/o instruction that's why it is called I/o processor.
* The I/o provide a path for transfer of data b/w various peripheral devices & the memory unit.
* The I/o processor & CPU is shared a common memory via system bus.
* The instruction execute by I/o processor are called channel Command words (CCW's).
  The instruction execute by I/o processor is of three types ——.

a) Data transfer instruction - Read/write operation.

b) Branch instruction - Fetch the next CCW.

c) I/o device control instruction - to control the peripheral devices

Flow-chart for CPU & I/o Communication