

3rd Sessional
4th Semester / Comp. Engg.
Subject: Computer Organization

Section - A

Ans-1

(i) Synchronous Data Transfer -

It is the type of data transfer in which both the devices (sender and receiver) are in sync with a clock signal.

In this, with every clock signal the data transfer starts and the sender and receiver starts sending and receiving data simultaneously.

(ii) Asynchronous Data Transfer -

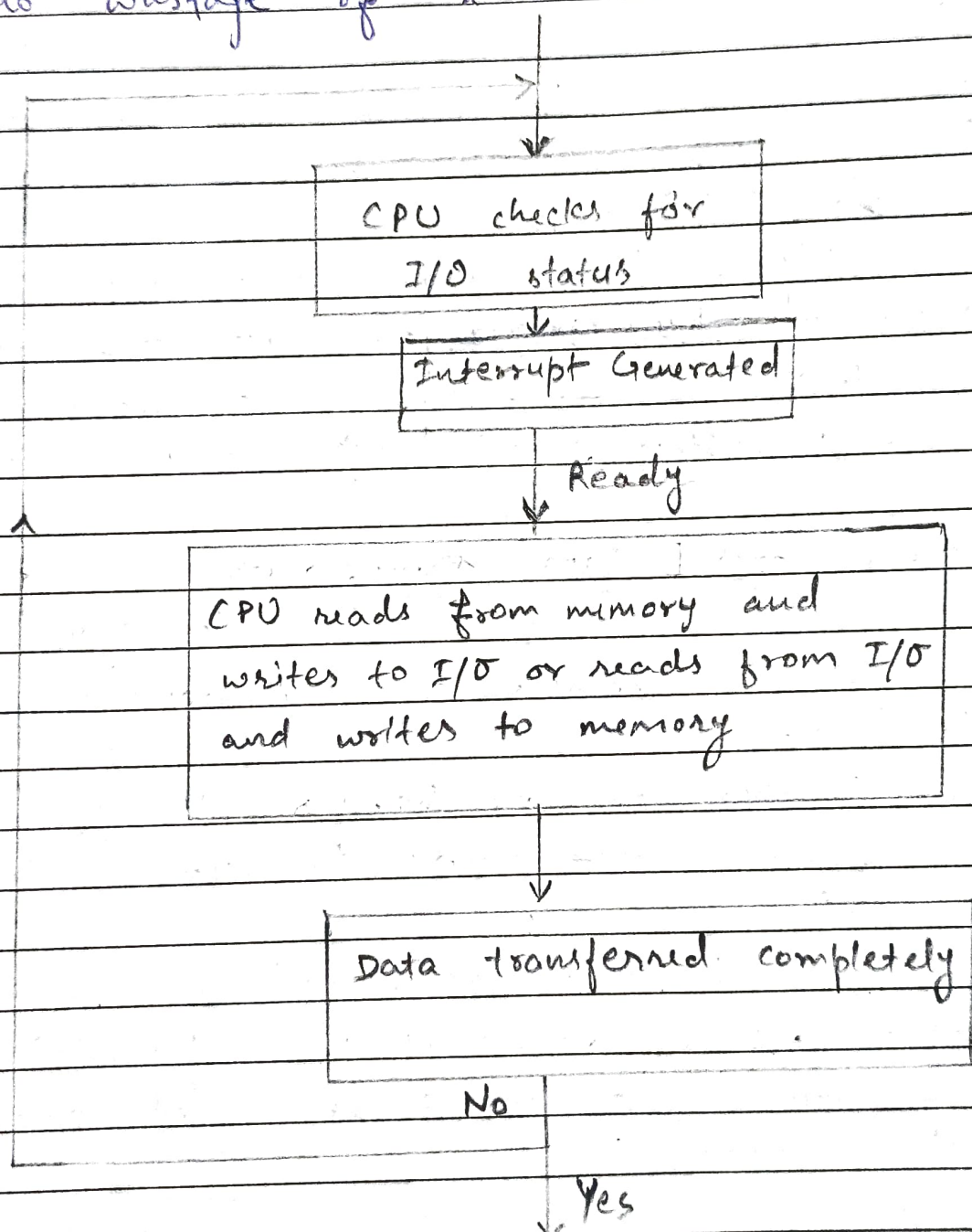
This type of transfer is opposite to synchronous data transfer.

In this type of data transfer, the sender and receiver doesnot work in sync (with clock signal).

The data is not transferred on any clock signal means data is transferred without any sync between sender and receiver.

(iii) Interrupt - Initiated I/O :

In this type of mode of transfer of data, the waiting time of CPU is removed because in this whenever I/O device needs data then the CPU generated an interrupt I/O command to ask for data and go to do its other works. In this way, the CPU works with full efficiency with no wastage of time.

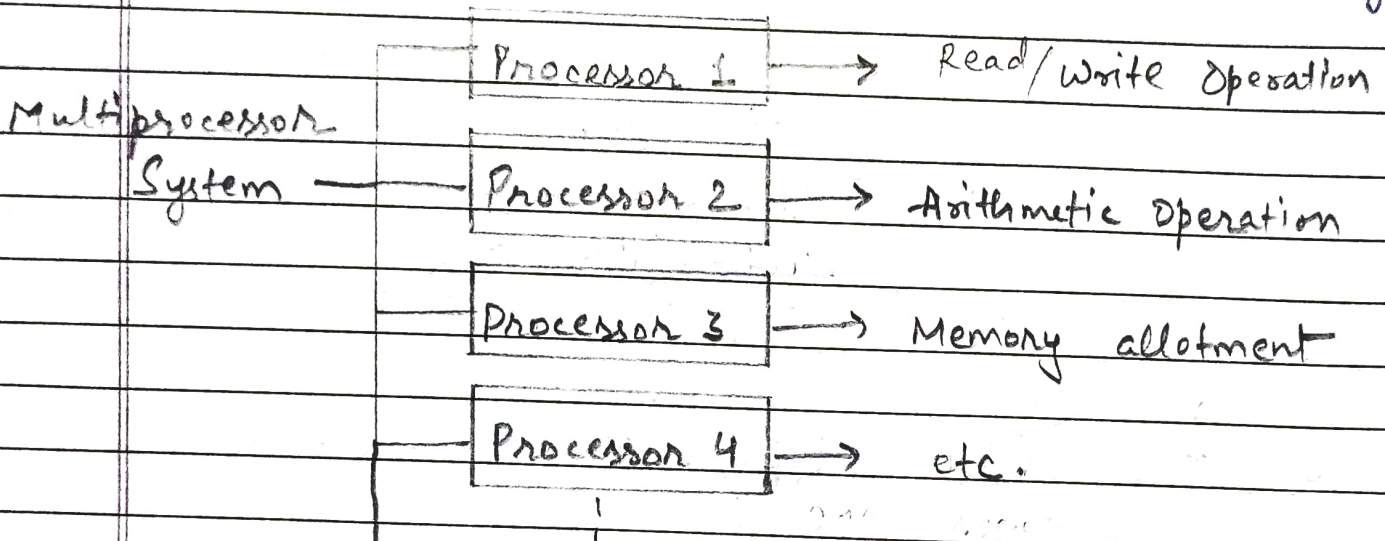


(iv) Parallel Processing :

In Parallel Processing, a task to be performed is first divided into different subtasks and then these subtasks are performed by different processors simultaneously.

For parallel processing -

- A task that can be divided conveniently into subtasks is required.
- A multiprocessor system is required which can perform different tasks simultaneously.



(v) Pipeline Processing :

In this type of processing, the processes are processed in such a way that every process is processed simultaneously but the first process is more processed as it is the first to start processed and others after it.

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In pipelining processing, sometimes the last task is started to process even when the first hasn't even completed.
 For example: four tasks (0, 1, 2, 3) are being processed using pipeline processing.

Start → 4 | 3 | 2 | 1 | - - - - - → End

4 | 3 | 2 | 1 | - - - - -

4 | 3 | 2 | 1 | → End

Section - B

Ans-3 The various types of Interconnection networks are :

- i) Shared Bus Multiprocessors
- ii) Hypercube Multiprocessors
- iii) Scalable Multiprocessors
- iv) Multithreaded Multiprocessors
- v) Cross bar Switches Multiprocessors
- vi) Multistaged Switches Multiprocessors

Ans-3

i)

Shared Bus Multiprocessors :

In this type of interconnection network, a bus is used to connect processor, memory and I/O device. In this, the bus is connected to different ~~at~~ processors and only one processor can use it at a time.

ii)

Hypercube Multiprocessors :

In this, microprocessors are connected to each other in a way that they make a square or cube.

$N = 2^n$ is the formula used in this. Here n = no. of microprocessors and N = Number of dimensions.

iii)

Scalable Multiprocessors -

It is an upgraded version of shared bus multiprocessors. It is almost same as the shared bus with addition of intercommunication networks.

In this, different processing units are connected to each other to form a communication network.

iv)

Multi-threaded Multiprocessors -

In this type of interconnection networks, all the microprocessors are connected to each other via data cache. It means it has shared data cache and also every

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microprocessor have its own data cache.

v) Cross bar Switches Multiprocessors -

In this type of interconnection system, switches are used. These switches are used as a unit of processing and these contain a main memory and processor with I/O device connected to

vi) Multistaged Switches Multiprocessors -

In this type of interconnection system, as the name suggests these contain SEs (Switching Elements) and are staged. It has memory elements on starting point and processing elements at end point.

These have options within, depending on the options selected the respected processor is activated.