

## Assignment No. 2

Ques-1 Explain auxillary memory.

Ans -

### Auxillary Memory :

It is also known as secondary memory. It is much larger than main memory, but its speed is comparatively slower. It normally stores system programs, other instructions, programs and data files. It is a permanent storage space and there is no limitation on its size. However for processing things need to be transferred to main memory from it and it works just like a backup storage.

It can also be used as overflow memory in case the main memory capacity has been exceeded. Secondary memory cannot be accessed directly by processor. First information of these memory is transferred to main memory and then information can be accessed as information of main memory.

Ques-2 Discuss cache memory and virtual memory.

Ans -

### Cache memory :

This kind of memory is increasingly being used in modern computers. It is logically positioned between internal

processor memory and main memory. It stores or catches some of contents of main memory which is currently in use of processor. It is a very high speed memory working between main memory and CPU registers. It is a costly memory so its size is limited. It is used to increase the speed of processing by making current programs and data available to CPU at a rapid rate.

### Virtual Memory:

In memory hierarchy system, programs and data are first stored in auxiliary memory. Virtual memory is used to give programmers the illusion that they have a very large memory at their disposal, even though the computer actually has a relatively small main memory. A virtual memory system provides a mechanism for translating program-generated addresses into correct main memory locations. This is done dynamically, while programs are being executed in the CPU. The translation or mapping is handled automatically by the hardware by means of a mapping table.

## Assignment No. 3

Ques-1 Discuss configuration, function and testing of BIOS.

Ans -

### Configuration of BIOS :

There are different options for its configuration, they vary from one BIOS manufacturer to another. In order to configure BIOS, you must first enter to configure BIOS the setup window. Once that is done, you can enter BIOS configuration window, where we get to see different sections listed at top of the screen.

The options that appear in all Basic I/O System configuration windows are as follows:

- System Time and Date
- Boot Sequence
- Plug and Play
- Mouse and Keyboard
- Drive Configuration
- Memory
- Security
- Power Management

### Functions of BIOS :

- i) BIOS Power on Self Test (POST)
- ii) Bootstrap Loader
- iii) BIOS Setup utility Program

#### iv) System service routine

##### Testing of BIOS :

After loading BIOS software, the next step is to perform a number of tests. These tests are referred to as POST or power-on self-test. These are a number of quick tests to check everything appears to be working. There may still be hardware faults, but the POST tests should pick up any basic problems.

Tests also include checks of any attached storage devices. This is basic testing to ensure the devices start up and are accepting commands. For example, a hard disk test would spin the drive up and test it to ensure the drive is can be accessed.

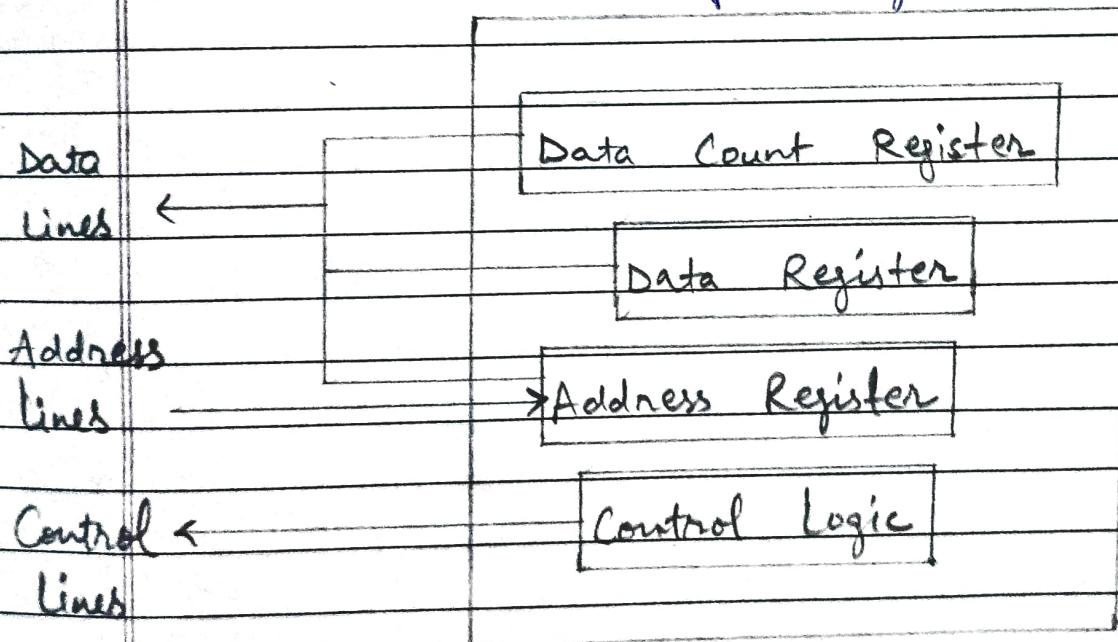
#### Ques-2 Explain DMA data transfer .

Ans -

##### Direct Memory Access (DMA) :

In this technique, memory can be accessed directly by I/O module; i.e. the I/O module can store / extract data in / from the memory. Direct memory access operates in following ways :

1. When an I/O is requested, CPU instructed the DMA module about the operations by providing the information.
  - (a) Which operation is to be performed.
  - (b) The address of I/O device which is to be used.
  - (c) Starting location on the memory where information will be read or written into.
  - (d) Number of words to be written or to be read.
2. DMA module transfer the requested block byte by byte directly to the memory without intervening the CPU.
3. On completion of request, DMA module sends an interrupt signal to CPU.



### DMA (Direct Memory Access)

Block diagram of DMA controller is shown above. In DMA, the CPU involvement can

be restricted at beginning and end of transfer. At that time CPU may execute another program or another part of same program. It contains additional registers for counting data types. Address register, data register and data count register are fed with data lines.

## Assignment No. 4

**Que-1** What are various types of interconnection networks in multi-processor systems?

**Ans-**

following are the various types of interconnection networks in multi-processor systems:

- i) Multithreaded Multiprocessors
- ii) Shared Bus Multiprocessors
- iii) Scalable Multiprocessors
- iv) Cross Bar Switches
- v) Multi-stage Switching Network
- vi) Hypercube Interconnection

i) Multithreaded Multiprocessors :

In these multiprocessors, the data cache is shared among all the processors. Each processor has its own instruction cache. It is simple microprocessor and also known as shared resource multiprocessor.

ii) Shared Bus Multiprocessors :

In these multiprocessors, a bus system is used to connect processing elements, main memory modules and I/O devices. All these components may be directly connected to a single bus and at a time only one pair of components can use the bus.

### iii) Scalable Multiprocessors :

In scalable multiprocessors, for fast communication among processors, shared memory, I/O and peripheral devices, efficient interconnection networks are used. In a large scale shared memory multiprocessor, multiple clusters are connected to memory and I/O devices through interconnection networks.

### iv) Cross Bar Switches :

Crossbar switching are most famously used in information processing applications such as telephony and circuit switching is a switch connecting multiple inputs to multiple output in matrix manner. A cross bar switch is an assembly of individual switches b/w multiple input and multiple output.

### v) Multistage Switching Network :

It is a class of high speed computer network usually composed of processing element on one end of w/w and memory elements on the other end, connected by switching elements (SEs). The basic component of a multistage network is a two-input, two-output interchange switch.

### v) Hypercube Interconnection :

Hypercube is a topology that has low communication diameter and high bisection width. The communication diameter is logarithmic in no. of processors the same as multistage and cross bar switches. These properties as well as highly systematic recursive structure of hypercube support a variety of efficient parallel algorithm.

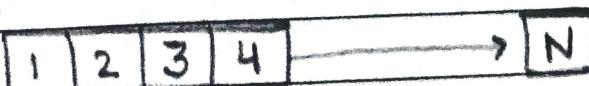
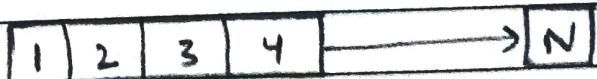
**Que-2 Explain Pipeline Processing .**

**Ans -**

### Pipeline Processing :

Pipelining is a process or technique used in advanced microprocessors where the microprocessor begins executing a second instruction before the first has been completed. That is, several instructions are in the pipeline simultaneously, each at a different processing stage.

Pipelined execution of an N Step Process



Time —————→