

STD: XI**COMPUTER SCIENCE****CHAPTER 3 . COMPUTER ORGANIZATION****1. What are the components of digital computer?****The components of digital computer:**

- ✓ A computer system is the integration of physical entities called hardware and non-physical entities called software.
- ✓ The hardware components include input devices, processor, storage devices and output devices.
- ✓ The software items are programs and operating aids (systems) so that the computer can process data.

2. What are the functional unit of the computer system?**The functional unit of the computer system:**

- Accept the data and program as input
- Store the data and program and retrieve as and when required.
- Process the data as per instructions given by the program and convert it into useful information
- Communicate the information as output

3. Write the essentials of the stored program concept.

The essentials of the stored program concept are

- the program and data are stored in a primary memory (main memory)
- once a program is in memory, the computer can execute it automatically without manual intervention.
- the control unit fetches and executes the instructions in sequence one by one.
- an instruction can modify the contents of any location in The stored program concept is the basic operating principle for every computer.

4. Write the main functions of the central processing unit.

The functions of the CPU are mainly classified into two categories :

- Co - ordinate all computer operations
- Perform arithmetic and logical operations on data

5. What are the different types of main memory?**The different types of main memory:**

There are different types of memory. They are Random Access Memory (RAM),

Read Only Memory (ROM), Programmable Read-Only Memory (PROM), Erasable Programmable Read-Only Memory (EPROM), Electrically Erasable Programmable Read-Only Memory (EEPROM).

6) Define memory read and memory write operations.

Memory read and memory write operations:

Operations on memories are called **reads and writes**, defined from the perspective of a processor or other device that uses a memory: a write instruction transfers information from other device to memory and a read instruction transfers information from the memory to other devices.

7) What do you mean by memory access time?

Access time, also known as response time or latency, refers to how quickly the memory can respond to a read or write request. Memory cycle time refers to the minimum period between two successive requests.

8. What is RAM?

RAM - Random Access Memory

- ✓ RAM is the most common type of memory found in the modern computers.
- ✓ The CPU store the results of the calculations in RAM.
- ✓ When we switch off a computer, whatever is stored in the RAM gets erased.
- ✓ It is a volatile form of memory.

9. What is ROM?

ROM - Read Only Memory

- ✓ In ROM, the information is burnt (pre-recorded) into the ROM chip at manufacturing time.
- ✓ Once data has been written into a ROM chip, it cannot be erased but you can read it.
- ✓ ROM is a non-volatile memory.

10. Define PROM.

Programmable Read Only Memory - PROM

- ✓ PROM is a memory on which data can be written only once.
- ✓ A variation of the PROM chip is that it is not burnt at the manufacturing time but can be programmed using PROM programmer or a PROM burner.
- ✓ PROM is also a non-volatile memory.

11. Define EPROM.

Erasable Programmable Read Only Memory - EPROM

In EPROM, the information can be erased and reprogrammed using a special PROM - programmer.

EPROM is non-volatile memory.

A EPROM differs from a PROM in that a PROM can be written to only once and cannot be erased. But an ultraviolet light is used to erase the contents of the EPROM.

12. Electrically Erasable Programmable Read Only Memory - EEPROM

- ✓ EEPROM is a recently developed type of memory.
- ✓ It can be erased by exposing it to an electrical charge.
- ✓ It is also non-volatile in nature.
- ✓ A flash memory is a special type of EEPROM that can be erased and reprogrammed.

13. What is an input device?

Input device:

- ✓ An input device is used to feed data into a computer.
- ✓ It is also defined as a device that provides communication between the user and the computer.
- ✓ Input devices are capable of converting data into a form which can be recognized by computer.
- ✓ For example, a keyboard is an input device.

14. Keyboard

- ✓ The most common input device is the keyboard.
- ✓ Keyboard consists of a set of typewriter like keys that enable you to enter data into a computer.
- ✓ The keyboard detects the key pressed and generates the corresponding ASCII codes which can be recognized by the computer.

15. Mouse

- ✓ Mouse is an input device that controls the movement of the cursor on the display screen.
- ✓ Mouse is a small device, you can roll along a flat surface.
- ✓ In a mouse, a small ball is kept inside and touches the pad through a hole at the bottom of the mouse.



- ✓ When the mouse is moved, the ball rolls. This movement of the ball is converted into signals and sent to the computer.
- ✓ You will need to click the button at the top of the mouse to select an option.
- ✓ Mouse is very popular in modern computers.



16. Scanner

- ✓ Scanner is an input device that allows information such as an image or text to be input into a computer.
- ✓ It can read image or text printed on a paper and translate the information into a form that the computer can use.
- ✓ It is used to convert images (photos) and text into a stream of data.
- ✓ They are useful for publishing and multi-media applications.

17. Bar Code Reader



- ✓ The barcode readers are used in places like supermarket, bookshops, etc.
- ✓ A bar code is a pattern printed in lines of different thickness.
- ✓ The bar-code reader scans the information on the barcodes and transmits to the computer for further processing.

18. Digital Camera



- ✓ The digital camera is an input device mainly used to capture images.
- ✓ The digital camera takes a still photograph, stores it and sends it as digital input to the computer.
- ✓ It is a modern and popular input device.

19. Touch Sensitive Screen



Touch Sensitive Screen is a type of display screen that has a touch-sensitive panel. It is a pointing device that enables the user to interact with the computer by touching the screen. You can use your fingers to directly touch the objects on the screen.

20. Magnetic Ink Character Recognition (MICR)

MICR is widely used by banks to process cheques. Human readable numbers are printed on documents such as cheque using a special magnetic ink. The cheque can be read using a special input unit, which can recognize magnetic ink characters.



21. Optical Character Recognition (OCR)

The OCR technique permits the direct reading of any printed character like MICR but no special ink is required. With OCR, a user can scan a page from a book. The computer will recognize the characters in the page as letters and punctuation marks, and stores. This can be edited using a word processor.



22. Optical Mark Reading and Recognition (OMR)

In this method special pre-printed forms are designed with boxes which can be marked with a dark pencil or ink. Such documents are read by a reader, which transcribes the marks into electrical pulses which are transmitted to the computer. They are widely used in applications like objective type answer papers evaluation in which large number of candidates appear, time sheets of factory employees etc.



23. Light Pen

A light pen is a pointing device shaped like a pen and is connected to a monitor. The tip of the light pen contains a light sensitive element which, when placed against the screen, detects the light from the screen enabling the computer to identify the location of the pen on the screen.



24. Magnetic Reader

Magnetic reader is an input device which reads a magnetic strip on a card. It also provides quick identification of the card's owner. All the credit cards, ATM cards (banks), petro cards, etc.



25. Smart Cards

This input device stores data in a microprocessor embedded in the card. This allows information, which can be updated, to be stored on the card. These data can be read

and given as input to the computer for further processing. Most of the identification cards use this method to store and retrieve the vital information.



26. Notes Taker

Notes taker is a device that captures natural handwriting on any surface onto a computer. Using an electronic pen, the **notes taker** displays the user's handwritten notes, memos or drawings on the computer, and stores the image for future use.



27. Microphone

Microphone serves as a voice input device. It captures the voice data and input to the computer. Using the microphone along with speech recognition software can offer a completely new approach to input information into your computer.

28. What is an output device?

- ✓ Output is anything that comes out of a computer.
- ✓ An output device is capable of presenting information from a computer.
- ✓ There are many output devices attached with the computers.
- ✓ The monitors and printers are commonly used output devices.



29. Monitors

Monitor is a commonly used output device, sometimes called as display screen. It provides a visual display of data. Most of the monitors have a 4 : 3 width to height ratio. This is called 'aspect ratio'.

30. Printers

Printer is an output device that prints text or images on paper or other media. By printing you create what is known as a 'hard copy'.

The two main types of printers are impact printers and non-impact printers.

31. Impact printer

- ✓ Impact printers include all printers that print by striking an ink ribbon.

- ✓ Impact printers use a print head containing a number of metal pins which strike an inked ribbon placed between the print head and the paper.
- ✓ Line printers, dot matrix printers are some of the impact printers.



32. Line Printer

- ✓ Line printers are high-speed printers capable of printing an entire line at a time.
- ✓ A line printer can print 150 lines to 3000 lines per minute.
- ✓ The limitations of line printer are they can print only one font, they cannot print graphics, the print quality is low and they are noisy to operate.
- ✓ But it can print large volume of text data very fast compared to the other printers.
- ✓ It is also used to print on multipart stationaries to prepare copies of a document.



33. Dot Matrix Printer

- ✓ The most popular serial printer is the dot matrix printer.
- ✓ It prints one line of 8 or 14 points at a time, with print head moving across a line.
- ✓ They are similar to typewriters.
- ✓ They are normally slow.
- ✓ The printing speed is around 300 characters per second.
- ✓ It uses multipart stationaries to prepare copies of a document.



34. Thermal Printer

- ✓ Thermal printers are printers that produce images by pushing electrically heated pins against special heat-sensitive paper.
- ✓ They are inexpensive and used widely in fax machines and calculators.



35. Laser Printers

- ✓ Laser printers use a laser beam and dry powdered ink to produce a fine dot matrix pattern.

- ✓ It can produce very good quality of graphic images.
- ✓ One of the chief characteristics of laser printers is their resolution - how many dots per inch (dpi) they lay down.
- ✓ The available resolutions range from 300 dpi at the low end to around 1200 dpi at the high end.



36. Inkjet Printers

- ✓ Inkjet printers use colour cartridges which combine magenta, yellow and cyan inks to create colour tones.
- ✓ A black cartridge is also used for crisp monochrome output.
- ✓ Inkjet printers work by spraying ionizing ink at a sheet of paper.
- ✓ Magnetized plates in the ink's path direct the ink onto the paper in the described shape.



37. Speakers

- ✓ The computer can also give produce voice output(audio data).
- ✓ Speaker serves as a voice output device.
- ✓ Using speakers along with speech synthesizer software, the computer can provide voice output.
- ✓ Voice output has become very common in many places like airlines, banks, automatic telephone enquiry system etc.

38. BUS

Any two components of the computer system, there is a pathway called a **bus** which allows for the data transfer between them.

39. ALU

The **arithmetic and logic unit (ALU)** is the part of CPU where actual computations take place. It consists of circuits which perform arithmetic operations over data received from memory and are capable of comparing two numbers.

40. REGISTER

The temporary storage area inside the CPU named **registers**. They are high-speed memories.

41. Storage Devices

The computer may need to store data, programs etc. in a computer readable medium . This is called the secondary storage. Secondary storage can be used to transmit data to another computer either immediately or a latter time. Some of the commonly used storage devices are hard disks, magnetic tapes, floppy disks and CD-ROM.



42. Hard Disk

Hard disk is a magnetic disk on which you can store computer data. The hard disk is a direct-access storage medium.



43. Magnetic Tape

A recording medium consisting of a thin tape with a coating of a fine magnetic strip, used for recording digital data. The tape itself is a strip of plastic coated with a magnetic recording medium.



44. Floppy Disk

The floppy drive uses a thin circular disk for data storage. It is a soft magnetic disk. It is a thin magnetic-coated disk contained in a flexible or semi-rigid protective jacket.



45. Optical Disk

Optical disks are a storage medium from which data is read and to which it is written by lasers. The optical disk is a random access storage medium; information can be easily read from any point on the disk. CD-ROM stands for Compact Disk - Read Only Memory.

46. Characteristics of Non-Impact Printers

- ❖ Non-impact printers are faster than impact printers because they have fewer moving parts.
- ❖ They are quiet than impact printers because there is no striking mechanism involved.
- ❖ They possess the ability to change typefaces automatically.
- ❖ These printers produce high-quality graphics

- ❖ These printers usually support the transparencies
- ❖ These printers cannot print multipart forms because no impact is being made on the paper.

47. Characteristics of Impact Printers

- ❖ In impact printers, there is physical contact with the paper to produce an image.
- ❖ Due to being robust and low cost, they are useful for bulk printing.
- ❖ Impact printers are ideal for printing multiple copies (that is, carbon copies) because they can easily print through many layers of paper.
- ❖ Due to its striking activity, impact printers are very noisy.
- ❖ Since they are mechanical in nature, they tend to be slow.
- ❖ Impact printers do not support transparencies.

Non-impact printers are much quieter than impact printers as their printing heads do not strike the paper. Non-impact printers include laser printers, inkjet printers and thermal printers.

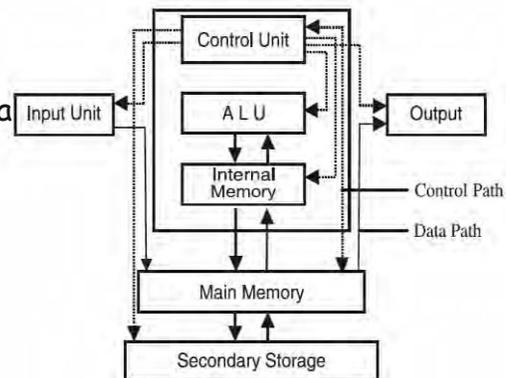
48. Describe in detail the various units of the Central Processing Unit

The CPU is the brain of the computer system. It performs arithmetic operations as well as controls the input, output and storage units. The functions of the CPU are mainly classified into two categories :

- Co - ordinate all computer operations
- Perform arithmetic and logical operations on data

The CPU has three major components.

- Arithmetic and Logic Unit
- Control Unit
- Registers (internal memory)



The arithmetic and logic unit (ALU) is the part of CPU where actual computations take place. It consists of circuits which perform arithmetic operations over data received from memory and are capable of comparing two numbers.

The **control unit** directs and controls the activities of the computer system. It interprets the instructions fetched from the main memory of the computer, sends the

control signals to the devices involved in the execution of the instructions.

While performing these operations the ALU takes data from the temporary storage area inside the CPU named **registers**. They are high-speed memories which hold data for immediate processing and results of the processing.

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