

**SUDHRASAN COLLEGE OF ARTS AND SCIENCE, PERUMANADU,
PUDUKKOTTAI.**

FUNDAMENTALS OF INFORMATION TECHNOLOGY (THEORY)

CLASS: II M.COM

UNIT -1

SUBJECT CODE:P16MC24T

Max.marks :45

SECTION – A (7 X2 =14)

Answer all the questions

1. What is a computer?

A computer is an electronic device that manipulates information or data. It has the ability to store, retrieve, and process data. Nowadays, a computer can be used to type documents, send email, play games, and browse the Web. It can also be used to edit or create spreadsheets, presentations, and even videos.

2. What is operating system?

It is a system software that controls the computer system. It also coordinates and supervise the activities of various components of the computer. The computer is switched on, its operating system starts functioning.

3. Write short note memory unit.

The primary job of the **memory unit** is to store data or instructions and intermediate results. Memory unit supplies data to the other units of a CPU. In Computer Organization, memory can be divided into two major parts primary memory and secondary memory.

- Main memory – It holds all data and instructions temporarily.
- Secondary memory – It is used to store the data, which are permanent.

4. Define CPU.

CPU (pronounced as separate letters) is the abbreviation for Central Processing Unit. Sometimes referred to simply as the central processor, but more commonly called processor, the CPU is the brain of the computer where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.

5. Define Software.

Software, in its most general sense, is a set of instructions or programs instructing a computer to do specific tasks. Software is a generic term used to describe computer programs. Scripts, applications, programs and a set of instructions are all terms often used to describe software.

6. What is programming language?

A programming language is a notation designed to connect instructions to a machine or a computer. Programming languages are mainly used to control the performance of a machine or to express algorithms. At present, thousand programming languages have been implemented. In the computer field, many languages need to be stated in an imperative form, while other programming languages utilize declarative form.

SECTION – B (3 X 4 =12)

Answer all the questions

7. (a) What are the characteristics of computer?

Speed

Computer can perform 100 millions of instruction per second. The speed of a computer is calculated by the unit MIPS. Normally computer speed is measured in NANO seconds. Speed of computer vary from machine to machine because of their hardware capabilities.

Accuracy

Computer can process data accurately. Error occurs very rarely. The error comes due to the following reasons: Inputting faulty data, wrong set of instruction, Hardware failures.

Storage

Computer can store large amount of data in small storage area. The stored data can be retrieved quickly. The storage capacity is measured in MB or GB.

Versatility

Computer are capable of solving various types of problems. It is used both in simple activities such as preparing papyroll and in complex activities such as controlling the aircraft.

Automation

Computers can do calculation automatically without human intervention until the completion of a program.

Diligence

Diligence means constant effort in works. Computers do calculations repetitively with same speed and same accuracy.

(OR)

(b) What are the advantages of storage device.

Computers play a large and unavoidable role in our lives. The more they get improved the more data storage space we need and the more data backup storage we then require.

Almost every computer owner needs a place to store all their information. It is important to have extra data backup storage space because this is used in case your computer gets viruses and crashes.

Data backup storage is one of the areas of computing that is growing and evolved and more storage devices are being created and improved.

Hard disk drive: A hard drive is a storage device that is mostly used for personal computers. A hard drive uses a magnet that records data on a rotating metal platter. The advantage of this drive is that it does not cost much and it has enough space or gigabyte of storage for the size of your PC. Hard drives are also very fast devices.

Solid state drive (SSD): Solid state drives are a replacement for conventional drives. Solid drives use flash memory and the memory can be written and rewritten as well as erased. Solid drives are quite pricey and more expensive than hard drives but they are more effective and they work faster.

Optical drive: An optical drive is just like any other drive and it uses a lens to read and write data. This works like a CD or DVD drive. Optical discs are forms of storage and it gives you access to remove one from a computer and read it on another machine.

Flash drive/ storage card: Flash drives and storage cards use flash memory to store data. They are very affordable but they offer less storage space, they are also small and they can connect to the computer by using a USB port. Almost all computers have USB ports and they have an operating system that is designed for speed and maximum storage.

Data Backup Storage

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8. (a) what are the features of mainframes ?

Large Number of CPU with Greatest Processing Power:

The mainframe has greatest processing capacity and to support this there is large number of CPU's with high processing power embedded within the frame.

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Huge Memory Capacity:

As explained before the mainframe applications takes its presence in large scale operations and to support this facility the memory capacity embedded within mainframe is very huge, in some cases it could even be about more than 8 Gigabyte.

Increased Performance by Sharing workload:

Mainframes systems have the ability to share the workload among different processors and input and output devices. This makes its processing ability and power to be efficient and increases its performance.

Centralized Computing:

The mainframe system handles centralized computing by which all the operations takes place in the processor section of mainframe and the results are seen in the desktop monitor with the help of a utility or program running on the mainframe background.

Ability to Run in Multiple Operating System:

Mainframes have the ability to run multiple operating systems and by this feature it is possible to function mainframe systems not as a single computer but as a number of virtual machines.

Supports Time Sharing Ability:

By the feature of Time Sharing Ability supported by mainframes it is possible for thousands of users to operate and use the machine simultaneously with efficiency.

Supports Sophisticated Operating system:

Mainframe system supports sophisticated operating systems like UNIX, Linux and VMS and IBM operating systems like Z/OS, Z/VM, and VSE/ESA.

Reliability:

The main important feature of mainframe system was its Reliability which made its usage wide spread among commercial customers. Mainframe systems are Reliable systems which gives high performance, which is essential for reasonable operations against a database.

(OR)

(b) Explain the different types of output device:

Devices, that are used to show the output of the computer are called output devices. Some of the output devices are

1.Printer:

Generates a hard copy version of processed data such as documents and photographs.

The computer transmits the image data to the printer, which then physically recreates the image, usually on paper.

Types of Printers

- Ink Jet – sprays tiny dots of ink on a surface to form an image.
- Laser – utilises toner drums that roll through magnetized pigment and then transfer the pigment to a surface.
- Dot Matrix – utilises a print head to set in images on a surface, using an ink ribbon. This is commonly used from 1980 to 1990.

2. Monitor:

This is the most common computer output device. It creates a visual display for users to view processed data. Monitors come in various sizes and resolutions.

- Cathode Ray Tube – use phosphorescent dots to generate the pixels that constitute displayed images.
- Flat Panel Screen – use liquid crystals or plasma to produce output. Light is passed through liquid crystals to generate the pixels.

3.Plotter:

Generates a hard copy of a digitally depicted design. The design is sent to the plotter through a graphics card and forms the design using a pen. It is generally used with engineering applications. It basically draws an image using a series of straight lines.

4.Speakers – are attached to computers for the output of sound. Sound cards are required in the computer for speakers to function. Speakers range from simple, two-speaker output devices to surround-sound multi-channel units.

5.Headset – is a combination of speakers and microphone. It is mostly used by gamers and is also great tool for communicating with family and friends over the internet using a VOIP software.

6.Projector – is a display device that projects a computer-created image. The computer transmits the image data to its video card, which then sends the video image to the projector. It is usually used for presentations or for viewing videos.

9. (a) Discuss the function of operating systems.

The key five basic functions of any operating system are as following

1. Interface between the user and the hardware : An OS provides an interface between user and machine. This interface can be a graphical user interface (GUI) in which users click onscreen elements to interact with the OS or a command-line interface (CLI) in which users type commands at the command-line interface (CLI) to tell the OS to do things.

2. Coordinate hardware components : An OS enables coordination of hardware components. Each hardware device speaks a different language, but the operating system can talk to them through the specific translational softwares called device drivers. Every hardware component has different drivers for Operating systems. These drivers make the communication successful between the other softwares and the hardware.

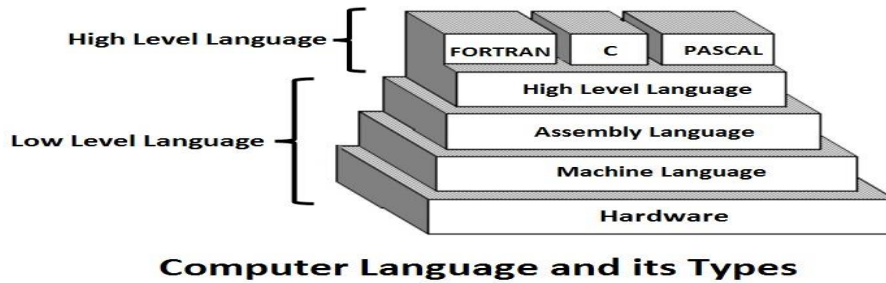
3. Provide environment for software to function: An OS provides an environment for software applications to function. An application software is a specific software which is used to perform specific task. In GUI operating systems such as Windows and macOS, applications run within a consistent, graphical desktop environment.

4. Provide structure for data management : An OS displays structure/directories for data management. We can view file and folder listings and manipulate on those files and folders like (move, copy, rename, delete, and many others).

5. Monitor system health and functionality: OS monitors the health of our system's hardware, giving us an idea of how well (or not) it's performing. We can see how busy our CPU is, or how quickly our hard drives retrieve data, or how much data our network card is sending etc. and it also monitors system activity for malware.

(OR)

(b) Explain different types of computer languages.



Low Level Language:

Low level languages are the machine codes in which the instructions are given in machine language in the form of 0 and 1 to a Computer system. It is mainly designed to operate and handle all the hardware and instructions set architecture of a Computer. Low level language is to operate, manage and manipulate the hardware and system components

- **Machine Language** is one of the low-level programming languages which is the first generation language developed for communicating with a Computer. It is written in machine code which represents 0 and 1 binary digits inside the Computer string which makes it easy to understand and perform the operations.
- **Assembly Language** is the second generation programming language that has almost similar structure and set of commands as Machine language. Because a Computer only understands machine code languages that's why we need an Assembler that can convert the Assembly level language to Machine language so the Computer gets the instruction and responds quickly.

High Level Language:

The high level languages are the most used and also more considered programming languages that helps a programmer to read, write and maintain. It is also the third generation language that is used and also running till now by many programmers. There is various high level programming languages like C, FORTRAN or Pascal that are less independent and also enables the programmer to write a program.

SECTION –C (3 X 7 = 21)

Answer any **THREE** questions

10. Explain the classification of computer.

Analog Computer

An analog computer (spelt analogue in British English) is a form of computer that uses *continuous* physical phenomena such as electrical, mechanical, or hydraulic quantities to model the problem being solved.

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Digital Computer

A computer that performs calculations and logical operations with quantities represented as digits, usually in the [binary number system](#)

Hybrid Computer (Analog + Digital)

A combination of computers those are capable of inputting and outputting in both digital and [analog signals](#). A hybrid computer system setup offers a cost effective method of performing complex simulations.

On the basis of Size: Type of Computer

Super Computer

The fastest and most powerful type of computer Supercomputers are very expensive and are employed for specialized applications that require immense amounts of mathematical calculations. For example, weather forecasting requires a [supercomputer](#).

Mainframe Computer

A very large and expensive computer capable of supporting hundreds, or even thousands, of users simultaneously. In the hierarchy that starts with a simple [microprocessor](#) (in watches, for example) at the bottom and moves to supercomputers at the top, mainframes are just below supercomputers.. But supercomputers can execute a single program faster than a mainframe.

Mini Computer

A mid-sized computer. In size and power, minicomputers lie between *workstations* and *mainframes*. In the past decade, the distinction between large minicomputers and small mainframes has blurred, however, as has the distinction between small minicomputers and workstations. But in general, a minicomputer is a multiprocessing system capable of supporting from 4 to about 200 users simultaneously.

Micro Computer or Personal Computer

- **Desktop Computer:** a personal or micro-mini computer sufficient to fit on a desk.
- **Laptop Computer:** a portable computer complete with an integrated screen and keyboard. It is generally smaller in size than a desktop computer and larger than a notebook computer.
- **Palmtop Computer/Digital Diary /Notebook /PDAs:** a hand-sized computer. Palmtops have no keyboard but the screen serves both as an input and [output device](#).

11. Discuss the different generation of computer

First Generation: Vacuum Tubes (1940-1956)

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The first computer systems used vacuum tubes for circuitry and magnetic drums for memory, and were often enormous, taking up entire rooms. These computers were very expensive to operate and in addition to using a great deal of electricity, the first computers generated a lot of heat, which was often the cause of malfunctions.

Few Examples are:

1. ENIAC
2. EDVAC
3. UNIVAC
4. IBM-701
5. IBM-650

Limitations of first generation

1. Large in size
2. Slow operations speed
3. Restricted computing capability
4. Limited programming capability
5. Very short lifespan
6. High consumption of electricity
7. Very high heating effect. So, proper cooling was required.

Second Generation: Transistors (1956-1963)

The world would see transistors replace vacuum tubes in the second generation of computers. The transistor was invented at Bell Labs in 1947 but did not see widespread use in computers until the late 1950s. The transistor was far superior to the vacuum tube, allowing computers to become smaller, faster, cheaper, more energy-efficient and more reliable than their first-generation predecessors.

• ***Few Examples are:***

1. Honeywell 400
2. IBM 7094
3. CDC 1604
4. CDC 3600
5. UNIVAC 1108

Third Generation: Integrated Circuits (1964-1971)

The development of the integrated circuit was the hallmark of the third generation of computers. Transistors were miniaturized and placed on silicon chips, called semiconductors, which drastically increased the speed and efficiency of computers.

• ***Few Examples are:***

1. PDP-8
 2. PDP-11
 3. ICL 2900
 4. IBM 360
 5. IBM 370
- ... and many more

Fourth Generation: Microprocessors (1971-Present)

The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip. What in the first generation filled an entire room could now fit in the palm of the hand. The Intel 4004 chip, developed in 1971, located all the components of the computer—from the central processing unit and memory to input/output controls—on a single chip.

- **Few Examples are:**
 1. IBM 4341
 2. DEC 10
 3. STAR 1000
 4. PUP 11

Fifth Generation: Artificial Intelligence (Present and Beyond)

Fifth generation computing devices, based on artificial intelligence, are still in development, though there are some applications, such as voice recognition, that are being used today. The use of parallel processing and superconductors is helping to make artificial intelligence a reality.

- **Few Examples are:**
 1. Desktop
 2. Laptop
 3. NoteBook
 4. UltraBook
 5. Chromebook

12. Elaborate the application of computers in various field.

Accounting

Computers are used to maintain accounts efficiently. Computers do inventory management, financial management and cash management and cash management very easily. In computerized accounting we can easily take the reports like trial balance, P&L and balance sheet.

Banking

Nowadays all banks are computerized. Customer transactions are maintained by computer transactions are maintained by computers. ATM are used for cash withdrawals and deposits.

Medical

In hospitals, computers are used to maintain patient details, their diseases, and treatments given by the doctors. Also, in hospitals, most of the equipments are computer controlled.

Education

Computers can be used in education to each students. It is used to create “Virtual class rooms” and “Virtual University”.

Designing

In textile business. It is used to draw new designs. By using AutoCad software.

Transport

In railways. It is used for reservation and cancellation of tickets in an easy manner. Airways and shipping corporation use computer in their day-to-day activities.

Cinema

Computers are used for adding graphical effects in films.

Engineering

Computer-aided manufacturing (CAM) software is used by the engineers to design new products before their manufacture.

Entertainment

Computers are used to play movie and to play games

Defense

Computer is used to control missiles efficiently.

Meteorology

In this field computers are used for fishing, shipping, weather forecast, and storm rescue operations.

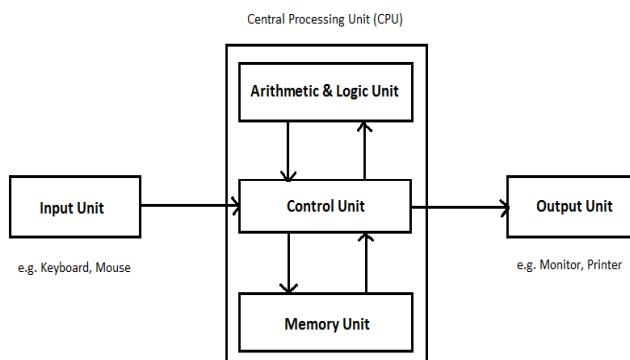
Publishing

Publishers use computers to prepare and format the contents of books

Insurance

Insurance companies use computer to maintain their policyholder details.

13. Explain the role of Central Processing Unit in the operation of a Computer.



Arithmetic and logic unit:

ALU can also be subdivided into 2 sections namely, **arithmetic unit** and **logic unit**. It is a complex digital circuit which consists of registers and which performs arithmetic and logical operations. Arithmetic sections perform arithmetic operations like addition, subtraction, multiplication, division etc. All other Complex operations can also be performed by repetition of these above basic operations.

The logic unit is responsible for performing logical operations such as comparing, selecting, matching and merging of different data or information.

So basically ALU is the major part of the computer system which handles different calculations. Depending on the design of ALU it makes the CPU more powerful and efficient.

Control unit:

It is the unit which controls all the operations of the different units but does not carry out any actual data processing operation. **Control unit** transfers data or instruction among different units of a computer system. It receives the instructions from the memory, interprets them and sends the operation to various units as instructed.

Control unit is also responsible for communicating with all input and output devices for transferring or receiving the instruction from the storage units. So, the control unit is the main coordinator since it sends signals and find the sequence of instructions to be executed.

Memory unit:

The primary job of the **memory unit** is to store data or instructions and intermediate results. Memory unit supplies data to the other units of a CPU. In Computer Organization, memory can be divided into two major parts primary memory and secondary memory. Speed and power and performance of a memory depends on the size and type of the memory.

14. Explain the different types of Input device.

Devices. Which are used to feed data into the computer are called input devices. Some of the input devices are

1. **Keyboard:** Keyboard has a set of keys like a typewriter. It has alphabetic keys for A,B,C...Z or a,b,c,...z. It has numeric keys like 0,1,2,3,...9. It has function keys F1, F2,...,F12 used to perform specific tasks. It has other keys used for editing like Delete, Backspace, Home, End, etc.
2. **Mouse:** Mouse is an input device used to control motion of the pointer on screen. A mouse has two or three buttons. These mouse buttons are called Left, Right and Middle button respectively. Buttons are used to perform different functions.

3. **Joystick:** Joystick is an input device used to play games on computer. It is used to control motion of an object quickly in game with the help of a hand held stick. This stick can be moved forward, backward or side ways
4. **Light pen:** Light pen is an input device consisting of a special pen that is connected to a computer's monitor. The user points at the screen with the pen and selects items or chooses commands either by pressing a clip on the side of the light pen or by pressing the light pen against the surface of the screen.
5. **Track ball:** Track Ball is an input device like a mouse. It is a pointing input device. It is used in Lap top / notebook computers to control motion of pointer on screen.
6. **Scanner :** It is used to save pictures or text on paper into computer memory. It converts picture or text on paper in to binary form and saves it in computer memory. With the help of scanner we may save our time to type a lot of text.
7. **Digital camera:** . We can take pictures with he help of digital camera. These pictures are saved on digital camera's internal memory. There is no need of a film role as used in traditional cameras.
8. **Touch screen:** In ATM and in latest smart phones, touch screen is used to receive input from the user. The user enters data by the touch of his finger on different menu options or icons present on touch screen.
9. **Digitizing tablet:** A graphics tablet consists of a special pen called stylus and a flat pad. The image is created on the monitor screen as the user draws it on the pad with the help of stylus (special pen). Graphics tablet is also called a digitizer.

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SECTION – A (7 X2 =14)

Answer all the questions

- 15. What is a computer?**
- 16. What is operating system?**
- 17. Write short note memory unit.**
- 18. Define CPU.**
- 19. Define Software.**
- 20. What is programming language?**

SECTION – B (3 X 4 =12)

Answer all the questions

- 21. (a) What are the characteristics of computer?**

OR

- (b) What are the advantages of storage device.**

- 22. (a) What are the features of mainframes ?**

OR

- (b) Explain the different types of output device:**

- 9. (a) Discuss the function of operating systems.**

OR

- (b) Explain different types of computer languages.**

SECTION –C (3 X 7 = 21)

Answer any THREE questions

- 10. Explain the classification of computer.**
- 11. Discuss the different generation of computer**
- 12. Elaborate the application of computers in various field.**
- 13. Explain the role of Central Processing Unit in the operation of a Computer.**
- 14. Explain the different types of Input device.**

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