01. List down configurations of a computer by mentioning each part and expected configurations for each if it is going to be used only for study activities. Mention the brand, the model of each component, and the specification.

(Processor, RAM, Internal storage, and Display)

Components	Brand	Model	Specification
Processor	AMD	AMD Ryzen™ 9 PRO 5945	• CPU cores-12 • Base clock- 3.0GHz • Max boost clock upto 4.7 GHz • L2 cache 6MB • L3 cache 64MB • Default top 64W
	INTEL	INTEL CoreTM i9-10920X X-series	• Total cores- 10 • Max turbo frq- 4.50GHz • Processor base Frq-3.70 GHz • Cache- 19.25MB Intel smart cache
RAM	G-SKILL	Ripjaws V series	• 32 GB 288-pin PC RAM DDR4 3200
	Cosair	XMS3	• 4GB DDR3 1600MHz C9 Memory kit
Internal storage	Western digital	WD blue PC desktop Hard Drive	• Capacity-500GB • Interface- SATA • Form Factor- 3.5 inch • Cache size- 32 MB
	Seagate	IronWolf 2TB NAS Internal HDD	• Capacity 2TB • Interface- SATA • CMR 3.5 inch • Cache size- 64MB
Display	DELL	Dell U4919DW	• Screen size-49 inches • Display resolution- 5120x1anti-glare • Special features- Adjustment, anti-glare screen, swivel adjustment, tilt adjustment, flicker-free, curved • Refresh rate- 60Hz • Connectivity technology- USB Type C
	SAMSUNG	SAMSUNG J791 Series	• Screen size- 34 inches • Display resolution 34440x1440 Pixels • Special features- USB Hub, Curved,Wide screen • Refresh rate 100Hz

02. Explain what is meant by a computer in your own words.

A computer can be defined in many ways.

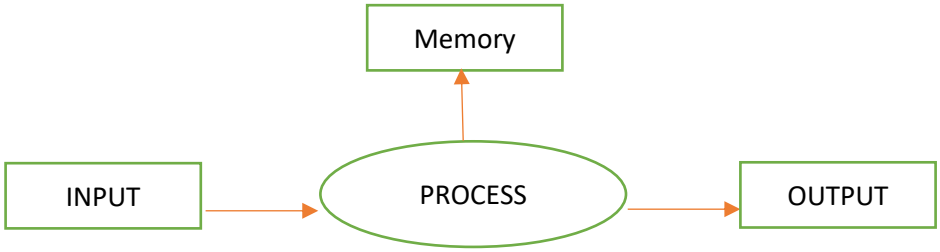
A computer is something that computes or calculates. It is a machine that takes in raw data and performs some calculations on it and gives us the formed output in the desired format. Also, can be defined as a programmable machine for inputting, processing, storing, and retrieving data.

Different computers used in different fields serve different purposes.
For example, Computers used in Bank and computers used in hospitals

03. Compare and contrast computers with typical machines. You may use appropriate diagrams if needed.

A **typical machine** is a less intelligent machine that produces output according to the input given by the user. When the user inputs a command, the machine process it and produces an output.

A **computer** is an intelligent device that also produces output according to the input given by the user. A computer has the ability to make its own decisions. When the user inputs data, the machine processes, stores it in the memory and produce an output.



04. Compare and contrast System software with Application software.

Software is any intangible part of a computer. Software can be divided into two main categories

- **System software**- software that is designed to control and work with the computer's hardware; operates directly on hardware devices. Machine friendly
    - **OS**- Operating system is the intermediate between the user and the computer hardware.
    - **Device drivers**- A set of files that says the hardware how to function by communicating with the computer's operating system.
    - **System utilities-** Required for maintenance of the computer; antivirus, network managers, Disk compression, and cleaning.
- **Application Software-** An End-user program designed to benefit the user to perform a task on the computer. User-friendly; MS Word, PowerPoint
  System software provides an OS and utilities that enable application software such as database programs.

05. Explain what is meant by Computer hardware and software with appropriate examples.

Parts of a computer can be divided into two-

Hardware- Hardware can be considered as all the tangible parts of a computer; Delivery systems that store and run the written instructions.
For example CPU, Hard disk drive, SSD

Software- Software can be considered as all the intangible parts of a computer. Set of instructions that are used to operate the computer to perform specific tasks.
Software can be divided into two

- **Application software-** This is an End-user program that is designed to befit the users. User-Friendly.
  Example- MS word PowerPoint, Paint

- **System software-** software that is designed to control and work with computer hardware. Machine friendly. It directly operates on computer hardware.
  Example- device driver, Operating system, system utility

5. **Explain the contribution of the motherboard in your own words.**

The motherboard serves as the backbone of the computer. It connects all the other parts in the computer system which enables the communication between them.

6. **Explain the difference between HDD and SSD Hard disk drives.**

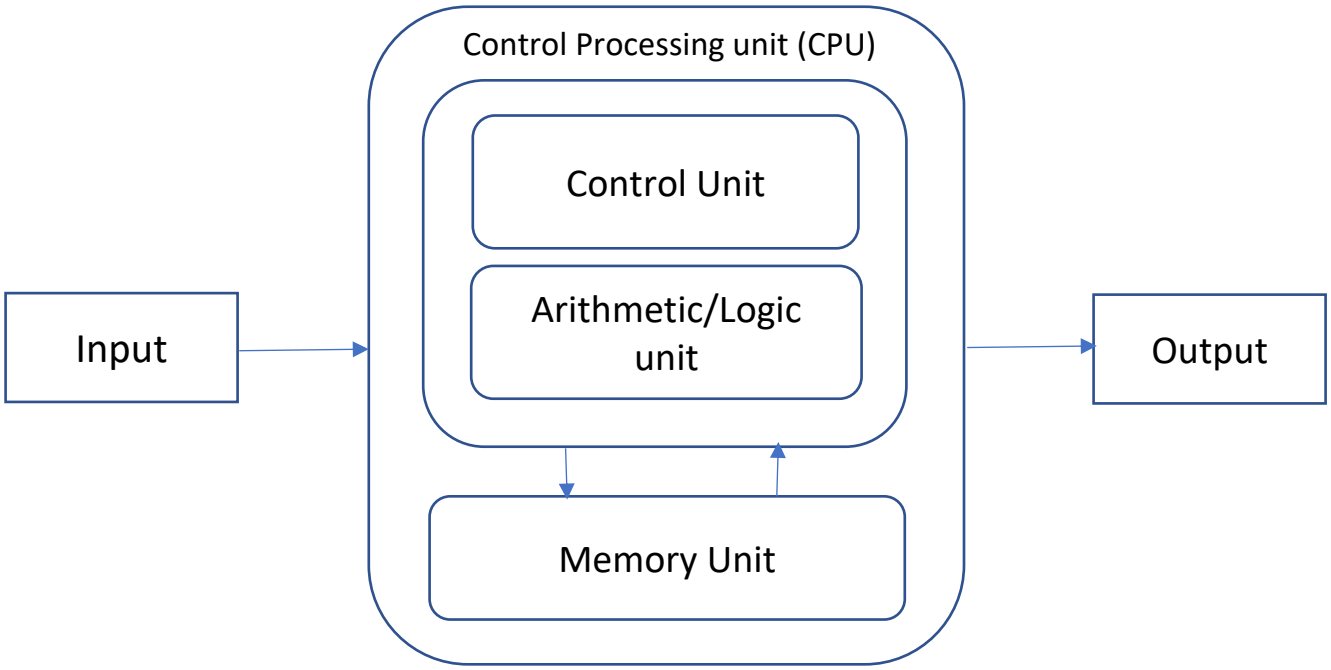
HDD	SSD
Hard Disk Drive	Solid State Drive
Contains moving mechanical parts: Arms	Contains electronic parts: IC's
Hard disk spins when it functions	No movement when it functions
Long Read/write time	Short Read/write time
Its heavy	Its light weighted
Consumes more electricity	Consumes less electricity
Large in size	Small in size
Cheap	A little expensive
Less Reliable	More Reliable
Slow as it uses spinning disks	Faster as it uses flash-based memory

7. **Compare and contrast (Similarities and difference) CRT, LCD, and LED monitors.**

CRT	LCD	LED
Cathode Ray tube Monitor	Liquid Crystal Display	Light Emitting Diode
Heavy/Large	Light, thin, and compact	Light, Thin, and Compact
Consumes high power	Consumes low power	Consumes low power
Low picture quality	High picture quality than CRT	High picture quality than LCD

8. Explain the contribution of a processor by your own words with the architectural diagram of the processor

CPU processor is the principal part of any digital computer system. Architectural diagram of the CPU also known as the von Neumann architecture



09) What are the classifications of a computer?

Computers are classified into Several categories, some of them are.

- Size
  - Supercomputers
  - Mainframe computers
  - Mini computer
  - Personal/Microcomputers
- Technology
  - Analog
  - Digital
  - Hybrid
- Purpose
  - Special-purpose
  - General-purpose

10) What is the main function of a computer system?

The main function of a computer is to process information. Computers are electronic devices that can input, store, process, and output data in various forms. They use a combination of hardware and software to perform different tasks such as calculations, data processing, communication, and control of other devices.

The processing of information in a computer involves three main stages:

1. **Input**: This is the stage where data is entered into the computer. Input devices such as a keyboard, mouse, microphone, scanner, and camera are used to input data into the computer.
2. **Processing**: This is the stage where the computer processes the input data by performing calculations, comparisons, and other operations. The processor, memory, and other components of the computer work together to process the data.
3. **Output**: This is the stage where the processed data is presented in a useful form. Output devices such as a monitor, printer, speakers, and others are used to present the processed data in a human-readable or machine-readable format.

Overall, the main function of a computer is to process information, which can be used for various purposes such as communication, entertainment, education, research, and many more.

11) What are the characteristics of a computer

The characteristics of a computer are:

- **Speed:** Computers can process data at very high speeds, enabling them to perform complex calculations and tasks quickly.
- **Accuracy:** Computers can perform calculations and process data with a very high degree of accuracy, eliminating human errors.
- **Storage:** Computers can store large amounts of data in various forms such as text, images, and videos. They can also access and retrieve data quickly and efficiently.
- **Automation:** Computers can automate many tasks, reducing the need for human intervention and increasing efficiency.
- **Versatility:** Computers can be programmed to perform a wide range of tasks and can adapt to different situations and environments.
- **Connectivity:** Computers can be connected to other computers and devices, enabling them to share data, communicate, and collaborate.
- **Reliability:** Computers are designed to be reliable, with built-in mechanisms to prevent system crashes, errors, and other problems.
- **Scalability:** Computers can be scaled up or down depending on the needs of the user, making them suitable for a wide range of applications.

Overall, these characteristics make computers a powerful tool for processing and manipulating data, enabling us to accomplish tasks that would be difficult or impossible to do manually.

12) What are the components of a computer?

- **Input unit**
- **Output unit**
- **Memory unit-** positioned in the central processing unit. Temporarily stores data needed for the function of ALU
- **Arithmetic and logic unit –** Perform all mathematical and logical functions
- **Control unit-** Control all devices of a computer

13) What are the functions of a computer?

- Receiving input
- Processing
- Storing
- Producing output

14) Write the bootup process of a computer.

The "operating system" of a computer is like a first, supervisory program that begins running when the computer first starts up.

1. **Power ON:** When the computer is turned on, the CPU begins executing instructions from the BIOS in ROM.
2. POST: The BIOS performs a Power-On Self-Test (POST) to check the functionality of hardware components like the CPU, RAM, hard drives, and other peripherals. If any issues are detected, an error message will be displayed.
3. **MBR:** Once the POST is complete, the BIOS loads the Master Boot Record (MBR) from the boot device (usually the hard drive) into RAM.
4. **Boot loader:** The MBR contains a small program called a boot loader that searches for the operating system on the boot device. The boot loader loads the operating system kernel into RAM.
5. **OS initialization:** The operating system kernel initializes the hardware and software components of the system and loads any necessary drivers.
6. **Login screen:** Once the operating system has finished initializing, the user is presented with a login screen where they can enter their username and password.
7. **Desktop or home screen:** After the user logs in, the operating system loads the user's desktop or home screen, where they can launch applications and perform other tasks.

15) Write a short note on CMOS?

CMOS stands for Complementary Metal-Oxide-Semiconductor, which is a type of technology used to construct electronic circuits, including those found in computer systems. In a computer, CMOS is most commonly used to refer to a small amount of memory that stores the system's basic hardware settings, called the CMOS memory or CMOS RAM.

The **CMOS memory** is a small amount of non-volatile memory that is used to store the system's basic hardware settings, such as the date and time, boot sequence, and other system configuration options. The CMOS memory is typically powered by a small battery on the motherboard, called the CMOS battery, even when the computer is turned off.

The **CMOS chip** is a microchip that contains the CMOS memory, as well as other components that are used to interface with the system hardware and provide basic system functionality. The CMOS chip is typically located on the motherboard of a computer and is responsible for maintaining the system's hardware settings, as well as providing basic system functionality such as power management and system monitoring.

The **CMOS battery**, as mentioned earlier, is a small, coin-shaped battery that is mounted on the motherboard of a computer. The CMOS battery is responsible for providing power to the CMOS memory, ensuring that its settings are retained even when the computer is turned off. The CMOS battery typically has a lifespan of several years and may need to be replaced periodically to ensure proper system operation.

16) Write a short note on motherboard.

The motherboard, also known as the mainboard or logic board, is the backbone of a computer system. It acts as the central hub for all of the components in the system and enables communication and data transfer between these components. The contribution of the motherboard to a computer system includes the following

- **Connectivity:** The motherboard provides the physical connections for the various components of a computer system, including the processor, memory, storage, and I/O devices.
- **Power Management:** The motherboard manages the power supply to the components and ensures that each component receives the appropriate amount of power.
- **Resource Management:** The motherboard allocates system resources, such as memory and I/O bandwidth, to the components that need them.
- **Data Transfer:** The motherboard enables data transfer between the various components in the system, allowing the processor to access information stored in memory, and enabling the I/O devices to transfer data to and from the system.
- **Expansion:** The motherboard provides expansion slots for adding additional components, such as graphics cards, sound cards, and additional storage, allowing the system to be upgraded and expanded as needed.
- **Firmware:** The motherboard often includes firmware, which is low-level software that provides basic services to other software and is responsible for controlling the basic functions of the system.

17) A short note on power supply unit

A Power Supply Unit (PSU) is an electronic device that converts the incoming AC (alternating current) voltage from a wall outlet into the DC (direct current) voltage required by a computer or other electronic devices. The PSU typically supplies power to the motherboard, processor, memory, graphics card, and other components in a computer.

18) Explain what is meant by Computer hardware and software with appropriate examples.

Parts of a computer can be divided into two

- Hardware
- Software

Hardware-

physical/tangible parts of a computer. Delivery systems that store and run instructions
CPU, Hard disk drive, SSD

Software-

are the intangible parts of a computer. A set of instructions, data, or programs that is used to operate the computer to perform tasks.

Software can be categorised into two

- System software
- Application software

System software

Directly operates on computer hardware. Software that is designed to control and work with computer hardware; Machine friendly

- OS- an intermediate between the user and the computer hardware.
- Device driver - a set of files that tells a piece of hardware how to function by communicating with computers OS.
- System utilities- required for computer maintenance.

Application Software
An end user program that is designed to befit the user; Human friendly.
MS Word, PowerPoint

System software provides a platform for application software to run on and ensures that the computer system is functioning properly and efficiently.

19) What are some other types of software available?

Programming software- use to develop software applications and programming languages; IDE's and compilers
Firmware- Software that is embedded into hardware devices; BIOS
Open-source software- software whose source code is publicly available and can be modified and redistributed by anyone; Linux
Proprietary Software- Software that is owned by a company or individual and cannot be modified or distributed without permission.; Adobe photoshop.
Freeware -Software that is available for free, often with limited functionality or features; WinZip

20) Explain the difference between HDD and SSD Hard disk drives.

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Hard Disk Drive	Solid State Drive
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Less Reliable	More Reliable
Slow as it uses spinning disks	Faster as it uses flash based memory

21) Compare and contrast (Similarities and difference) CRT, LCD, and LED monitors.

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Heavy/Large	Light, thin, and compact	Light, Thin, and Compact
Consumes high power	Consumes low power	Consumes low power
Low picture quality	High picture quality than CRT	High picture quality than LCD

22) What is a processor and its core's?

A processor, also known as a central processing unit (CPU), is the main computing component of a computer. It is responsible for executing instructions and performing calculations on data.

A processor can have one or more cores, which are individual processing units within the same physical CPU. Each core is capable of executing instructions independently of the others, allowing for parallel processing and faster overall performance.

- **Single-core processors** have only one processing unit (or core) within the physical CPU. This means that the processor can only handle one set of instructions at a time.
- **Dual-core processors** have two processing units (or cores) within the same physical CPU, allowing for simultaneous processing of two sets of instructions.
- **Quad-core processors** have four processing units (or cores) within the same physical CPU, allowing for simultaneous processing of four sets of instructions.
- **Multi-core processors** are commonly found in modern computers, allowing for faster and more efficient processing of data and applications that are designed to take advantage of multiple cores.

In general, the more cores a processor has, the better it will perform when running multiple tasks, but other factors such as clock speed, memory, and other components also play a role in determining the overall performance of a computer system.