**IITM**

**Question Bank**

**BCA I Year Semester I**

**Subject Name: FCIT**

**Subject Code: BCA-105**

**Unit-1**

**Section-A**

**Q1 Very Short questions of single line answer**

1. **Describe peripheral devices?**

Ans. A peripheral device is an internal or external device that connects directly to a computer but does not contribute to the computer's primary function, such as computing. It helps end user’s access and use the functionalities of a computer.

1. **What do you mean by cache memory?**

Ans. Cache memory is a small-sized type of volatile computer memory that provides high-speed data access to a processor and stores frequently used computer programs, applications and data. It is the fastest memory in a computer, and is typically integrated onto the motherboard and directly embedded in the processor or main Random Access Memory (RAM).

1. **1Byte = \_\_8\_\_ bits**.
2. **What do you mean by RAM?**

Ans. Random access memory (RAM) is a type of data storage used in computers that is generally located on the motherboard. This type of memory is volatile and all information that was stored in RAM is lost when the computer is turned off. There are two types of RAM- DRAM and SRAM.

1. **Define ROM?**

Ans. Read-only memory (ROM) is a type of storage medium that permanently stores data on personal computers (PCs) and other electronic devices. It contains the programming needed to start a PC, which is essential for boot-up, it performs major input/output tasks and holds programs or software instructions. Because ROM is read-only, it cannot be changed, it is permanent and non-volatile, meaning it also holds its memory even when power is removed. There are different types of ROM:

* Programmable Read-Only Memory (PROM)
* Electrically Programmable Read-Only Memory (EPROM)
* Electrically Erasable Programmable Read-Only Memory (EEPROM; also called Flash ROM)
* Electrically Alterable Read-Only Memory (EAROM)

1. **Describe the parts of CPU?**

Ans.The two typical components of a CPU include the following:

1. The arithmetic logic unit (ALU), which performs arithmetic and logical operations.
2. The control unit (CU), which extracts instructions from memory and decodes and executes them, calling on the ALU when necessary.
3. **What do you mean by data and information?**

Ans.Data is raw, unorganized facts that need to be processed. Data can be something simple and seemingly random and useless until it is organized.

When data is processed, organized, structured or presented in a given context so as to make it useful, it is called information.

1. **Name any two output devices?**

Ans. Monitor and Printer.

1. **Define micro program?**

Ans.A microprogram is a program that controls the functions of a central processing unit or peripheral controller of a computer.

1. **ENIAC stands for?**

Ans. ENIAC means **Electronic Numerical Integrator And Computer**.

1. **What is the drawback of optical disk storage?**

Ans. 1. Reusability – Other than in certain cases such as Rewrite media, once the media has been written toit cannot be erased and have something new written to it.

2. Cost – The cost per gigabit of storage is higher for optical media

3. Copying speed- The transfer speed is not as fast as magnetic disks.

**Section-B**

1. **List any 4 difference between Hardware & Software?**

Ans.

|  |  |
| --- | --- |
| **Hardware** | **Software** |
| 1. Devices that are required to store and execute (or run) the software are known as Hardware. | 1. Collection of instructions that enables a user to interact with the computer. Software is a program that enables a computer to perform a specific task, as opposed to the physical components of the system (hardware). |
| 1. Types of Hardware are Input, storage, processing, control, and output devices. | 1. Types of Software are System software and Application software. |
| 1. Hardware serve as the delivery system for software solutions. The hardware of a computer is infrequently changed, in comparison with software and data. | 1. To perform the specific task, you need to complete. Software is generally not needed to for the hardware to perform its basic level tasks such as turning on and responding to input. |
| 1. Example: CD-ROM, monitor, printer, video card, scanners etc. | 1. Example: Microsoft Windows, Linux, Google Chrome, Microsoft Word, |

1. **List any 4 difference between Interpreter & Compiler?**

Ans.

|  |  |
| --- | --- |
| **Interpreter** | **Compiler** |
| 1. Translates program one statement at a time. | 1. Scans the entire program and translates it as a whole into machine code. |
| 1. It takes less amount of time to analyse the source code but the overall execution time is slower. | 1. It takes large amount of time to analyse the source code but the overall execution time is comparatively faster. |
| 1. No intermediate object code is generated, hence are memory efficient. | 1. Generates intermediate object code which further requires linking, hence requires more memory. |
| 1. Continues translating the program until the first error is met, in which case it stops. Hence debugging is easy. | 1. It generates the error message only after scanning the whole program. Hence debugging is comparatively hard. |

1. **Distinguishbetween parallel computer and distributed computer?**

Ans.

|  |  |
| --- | --- |
| **Parallel Computer** | **Distributed Computer** |
| 1. Parallel Processing systems are referred to as tightly coupled systems. | 1. Distributed Operating systems are also referred to as Loosely Coupled systems. |
| 1. Tightly coupled system there is a single systemwide primary memory shared by all the processors. | 1. A Loosely coupled system is one in which the processors do not share memory and each processor has its own local memory. |
| 1. The processors of distributed operating systems cannot be placed far away from each other. | 1. The processors of distributed operating systems can be placed far away from each other to cover a wider geographic area. |
| 1. The number of processors that can be usefully deployed is very small in a parallel processing operating system. | 1. In a distributed operating system a larger no. of processors can be usefully deployed. |

1. **Describe the major components of digital computer?**

Ans. Major Components of a digital computer are:

1. **Input Devices**

These are the devices using which the user provides input instances. In a programmable computer, input devices are also used to input programs. Examples: keyboard, mouse.

1. **Output Devices**

These devices notify the user about the outputs of a computation. Example: screen, printer.

1. **Processing unit**

The central processing unit (CPU) is the brain of the computing device and performs the basic processing steps. A CPU typically consists of:

1. **An Arithmetical and Logical Unit (ALU):** This provides the basic operational units of the CPU. It is made up of units (like adders, multipliers) that perform arithmetic operations on integers and real numbers, and of units that perform logical operations.
2. **A Control Unit:** This unit is responsible for controlling flow of data and instructions.
3. **Registers:** A CPU usually consists of a finite number of memory cells that work as scratch locations for storing intermediate results and values.
4. **External Memory**

The amount of memory (registers) resident in the CPU is typically very small and is inadequate to accommodate programs and data even of small sizes. Out-of-the-processor memory provides the desired storage space. External memory is classified into two categories:

1. **Main (or Primary) Memory:** This is a high-speed memory that stays close to the CPU. Programs are first loaded in the main memory and then executed. Usually main memory is volatile, i.e., its contents are lost after power-down.
2. **Secondary Memory:** This is relatively inexpensive, bigger and low-speed memory. It is normally meant for off-line storage, i.e., storage of programs and data for future processing. One requires secondary storage to be permanent, i.e., its contents should last even after shut-down. Examples of secondary storage include floppy disks, hard disks and CDROM disks.
3. **What are the major functions of a computer?**

Ans.A computer has four main functions, they are

* Input
* Processing
* Output
* Storage
* Input

Input is the data entered in to a computer from the input devices like keyboard, mouse, scanner etc. Input data can be a character, word, image etc. When you enter information (input) in to your computer a signal is send to CPU (central processing unit).

* Processing

The task of performing the operations like logical and arithmetic operations is called processing. The CPU (Central Processing Unit) will perform all types of calculations based on the instructions given. It is then send to the storage unit.

* Output

The process of producing the useful information for the user after processing input data is called output. After performing the calculations based on given instructions, the processed data is send to the output device. Output device then translates the processed data in to a form (text, image, document etc) that can understand to the user.

* Storage

The process of storing instructions and data permanently is called storage. This stored data can be retrieved whenever needed

1. **Describe the characteristics of computer?**

Ans.**Characteristics of Computer**

* **SPEED :** In general, no human being can compete to solving the complex computation, faster than computer.
* **ACCURACY**: Since Computer is programmed, so what ever input we give it gives result with accuratly.
* **STORAGE** : Computer can store mass storage of data with appropriate formate.
* **DILIGENCE** : Computer can work for hours without any break and creating error.
* **VERSATILITY** : We can use computer to perform completely different type of work at the same time.
* **POWER OF REMEMBERING** : It can remember data for us.
* **NO IQ** : Computer does not work without instruction.
* **NO FEELING** : Computer does not have emotions, knowledge, experience, feeling.

1. **Describe any 3 I/O devices of each in details?**

Ans.INPUT DEVICES:

* 1. Optical Character Recogition – Scanner equipped with a character recognition

software (called

OCR system) that converts the bit map images of character to equivalent ASCII

code. Enables

word processing of input text and also requires less storage for storing the

document as text

rather than an image. OCR software is extremely complex because it is difficult

to make a computer recognize an unlimited number of type face and font. Two

standard

OCR fonts are

OCR-A (American Standard) typefaces.

* 1. **Optical mark recognition** (also called **optical mark reading** and **OMR**) is the process of capturing human-marked data from [document forms](https://en.wikipedia.org/wiki/Form_(document)) such as surveys and tests. They are used to read questionnaires, multiple choice examination paper in the form of lines or shaded areas.
  2. **Keyboard:** A computer **keyboard** is one of the primary [input devices](https://www.computerhope.com/jargon/i/inputdev.htm) used with a computer that looks similar to those found on electric [typewriters](https://www.computerhope.com/jargon/t/typewriter.htm), but with some additional keys. Keyboards allow you to input [letters](https://www.computerhope.com/jargon/l/letter.htm), [numbers](https://www.computerhope.com/jargon/n/number.htm), and other [symbols](https://www.computerhope.com/jargon/s/symbol.htm) into a computer that can serve as commands or be used to type text.

OUTPUT DEVICES:

* 1. A **printer** is an [external](https://www.computerhope.com/jargon/e/external.htm) hardware [output device](https://www.computerhope.com/jargon/o/outputde.htm) that takes the electronic data stored on a computer or other device and generates a [hard copy](https://www.computerhope.com/jargon/h/hardcopy.htm) of it. For example, if you created a report on your computer you could print several copies to hand out at a staff meeting. Printers are one of the most popular computer peripherals and are commonly used to print text and photos.
  2. A **computer monitor** is an output device that displays information in pictorial form. A monitor usually comprises the [display device](https://en.wikipedia.org/wiki/Display_device), [circuitry](https://en.wikipedia.org/wiki/Electronic_circuit), casing, and [power supply](https://en.wikipedia.org/wiki/Power_supply). The display device in modern monitors is typically a [thin film transistor liquid crystal display](https://en.wikipedia.org/wiki/Thin_film_transistor_liquid_crystal_display) (TFT-LCD) with [LED backlighting](https://en.wikipedia.org/wiki/LED-backlit_LCD) having replaced [cold-cathode fluorescent lamp](https://en.wikipedia.org/wiki/Cold-cathode_fluorescent_lamp) (CCFL) backlighting. Older monitors used a [cathode ray tube](https://en.wikipedia.org/wiki/Cathode_ray_tube) (CRT). Monitors are connected to the computer via [VGA](https://en.wikipedia.org/wiki/VGA_connector), [Digital Visual Interface](https://en.wikipedia.org/wiki/Digital_Visual_Interface) (DVI), [HDMI](https://en.wikipedia.org/wiki/HDMI), [DisplayPort](https://en.wikipedia.org/wiki/DisplayPort), [Thunderbolt](https://en.wikipedia.org/wiki/Thunderbolt_(interface)), [low-voltage differential signaling](https://en.wikipedia.org/wiki/Low-voltage_differential_signaling)(LVDS) or other proprietary connectors and signals.
  3. **Computer speakers**, or **multimedia speakers**, are [speakers](https://en.wikipedia.org/wiki/Loudspeaker) sold for use with computers, although usually capable of other audio uses, e.g. for an [MP3 player](https://en.wikipedia.org/wiki/MP3_player). Most such speakers have an internal amplifier and consequently require a power source, which may be by a mains power supply often via an [AC adapter](https://en.wikipedia.org/wiki/AC_adapter), batteries, or a [USB](https://en.wikipedia.org/wiki/USB) port (able to supply no more than 2.5W DC, 500mA at 5V). The signal input connector is often a 3.5 mm jack plug (usually color-coded lime green per the [PC 99](https://en.wikipedia.org/wiki/PC_System_Design_Guide#PC_99) standard); [RCA connectors](https://en.wikipedia.org/wiki/RCA_connector) are sometimes used, and a USB port may supply both signal and power (requiring additional circuitry, and only suitable for use with a computer).

1. **Describe the computer generation based on the I) hardware ii) software iii) physical appearance?**

**Ans:**

**ON THE BASIS OF HARDWARE**

**First Generation Of Computer**

* The first computers used vacuum tubes for circuitry and magnetic drums for memory.
* They were often enormous and taking up entire room.
* First generation computers relied on machine language.
* . They were very expensive to operate and in addition to using a great deal of electricity, generated a lot of heat, which was often the cause of malfunctions.
* The UNIVAC and ENIAC computers are examples of first-generation computing devices**.**

**Second GerationOf Computer**

* Transistors replaced vacuum tubes and ushered in the second generation of computers.
* Second-generation computers moved from cryptic binary machine language to symbolic.
* High-level programming languages were also being developed at this time, such as early versions of COBOL and FORTRAN.
* These were also the first computers that stored their instructions in their memory.

**Third Generation of Computer**

* The development of the integrated circuit was the hallmark of the third generation of computers.
* Transistors were miniaturized and placed on siliconchips, called semiconductors.
* Instead of punched cards and printouts, users interacted with third generation computers through keyboards and monitors and interfaced with an operating system.
* Allowed the device to run many different applications at one time.

**Fourth Generation Of Computers**

* The microprocessor brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip.
* 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.
* . Fourth generation computers also saw the development of GUIs, the mouse and handheld devices.

**FiFth Generation Of Computer**

* Fifth generation computing devices, based on artificial intelligence.
* Are still in development, though there are some applications, such as voice recognition.
* The use of parallel processing and superconductors is helping to make artificial intelligence a reality.
* The goal of fifth-generation computing is to develop devices that respond to natural language input and are capable of learning and self-organization.

**ON THE BASIS OF SOFTWARE**

1. **First Generation Languages (1GL)**

The earliest computers were based on vacuum tube technology and hardware design was in its infancy. The only way to program these computers was to enter the machine language instructions directly into the hardware. Writing programs for these early computers had many limitations:

* Programming was tremendously time consuming,
* The programs were prone to errors
* Debugging often took longer than writing the original program
* Programmers needed a great deal of skill and specialized training and
* Machine languages were different for every type of computer.

1. **Second Generation Languages (2GL)**

Some improvements were made during the 1950s with the development of assembly languages. Early software pioneers, such as Grace Hopper, realized that they could write programs in a type of programming short-hand and then have the computer translate this short-hand notation into machine code. The advantages of Assembly Languages included:

* Operations are given a meaningful name
* Names are assigned to storage locations
* Programs are easier to read and therefore easier to debug
* The Assembler program does the tedious translation of the program into machine language.

1. **Third Generation Languages (3GL)**

* By the late 50s and early 60s, the computer industry was in full production. Many large and medium businesses as well as most universities and government departments were installing computers. Along with this boom came a crucial period often called the Software Crisis. While advances had been made in writing software such as assemblers, every computer system still required custom written software. There simply were not enough programmers and time to do it all. The solution: develop a faster way of writing and debugging software.
* Leading thinkers such as AlickGlennie and Grace Hopper realize that they could extend the concept of the Assembler even further. The result was a series of computer programs (compilers) that translated high-level programming languages into machine code.
* These high-level or 3GLs are characterized by their use of English-like commands in place of the obscure codes of Assembly languages. Each line of code in a 3GL often corresponds to many lines of machine code. These are often called procedural languages because the programmer must develop a clear logic to carry out each procedure within the program. Since 3GLs are portable or machine independent, international standards have often been developed. This has greatly simplified the training and preparation that software engineers need.

1. **Fourth Generation Languages (4GL)**

* The examples of 3GLs given above are all procedural languages because the programmer must list each instruction and indicate the order that these steps are to be executed through the use of logical control structures (Sequence-Selection-Iteration). Fourth Generation Languages are non-procedural languages. This means that the programmer does not specify a step-by-step method for executing a given problem. Instead, the inputs and required outputs are given and it is left up to the language to determine the step-by-step details.
* The major disadvantage of 4GLS is that the resulting programs may not use the computer's processing power efficiently. Consequently more powerful computers are needed to run this type of program. The most significant advantage, however, is that 4GL programs are much easier to write. They contain a minimum of syntax rules and even people not trained as programmers can write applications.
* One of the more common forms of 4GLs are query languages. These are frequently used to retrieve information from databases. An example of a query is "display all clients with date-of-birth before 1931". Other types of 4GL are report generators and application generators.

**Firth Generation Languages (5GL)**

* Not commonly listed in the generations of software are the Fifth Generation programming languages. Connected closely with Artificial Intelligence research and expert systems, there are few commercially available 5GLs.
* LISP is one of the oldest programming languages still in use but it has been updated with 5GL programming methodology. The result is that most expert systems are coded in LISP. PROLOG is another 5GL that was developed in France in 1972. It has been expanded and improved over the last few decades and is used in Artificial Intelligence research.

**ON BASIS OF PHYSICAL APPEARANCE**

1. **Microcomputer:**

* Microcomputer is a small sized and inexpensive computer originated in late 1970’s .
* Early Microcomputer -8 bit microprocessor chip now -16 bit ,32 bit ,64 bit
* CPU Speed: >100kilo instructions per second(kips).
* A micro computer is a device which must be capable of :-
  1. Receiving inputs .
  2. Performing arithmetic and Logical computation in ALU .
  3. Storage of data and Instructions.
  4. Displaying results through output device
  5. Directly or indirectly controlling devices

Microcomputers have been considered to be of two types:-

* **Personal Computers(PC):**

🡪 Personal Computer is a small single user computer based on a microprocessor .

* A Pc has several chips (CPU chip, RAM chip , ROM chip ,I/O handling chips

etc.) neatly assembled on main circuit board called as system board or mother

board.

1. **Workstation**

* Workstation is a powerful single user computer .
* It is like a PC but has more powerful microprocessor.
* Used for Engineering applications (CAD/CAM), Desktop publishing (DTP), software development, Multimedia, and other scientific problems.
* In networking ,workstations refers to any computer connected to a local area network (LAN).

1. **Minicomputer**

* Small general purpose computer with computing power larger than a microcomputer .
* Capacity lies between microcomputers and mainframe computers.
* Designed to handle multiple client requests.
* Provides facility of communication links between multiple computers .
* They have word length of 15 bits or more. memory :256 kb to 3 Mb,CPU speed :500 kips to 1 MIPS.
* Minicomputer🡪evolved🡪 32 bit minicomputers **(supermini)** .
* used to control machines in manufacturing unit.
* Eg: VAX made by Digital Equipment Corporation

1. **Mainframe**

* more powerful than minicomputer .
* Word length : 32 bits or more, Memory size :1 MB to 16 MB,CPU speed:1-10 MIPS.
* Supports 100 users in timesharing mode; can have wide variety of languages and operating systems.
* Also used as **central host computer** in distributed system.
* Mainly used in insurance companies, banks, government agencies, etc.
* Huge in size
* Eg: MEDHA, SUPERRY, DEC, IEL.

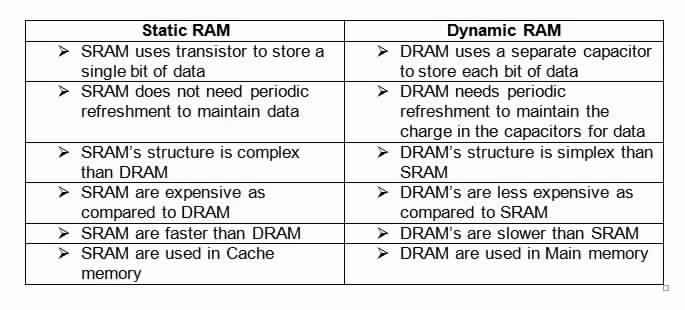
1. **Supercomputer**

* Most powerful computers ,extremely high processing speed and very large size.
* Requires special cooling system, power protection and other security features.
* Speed : in nanosecond to 1 million ,faster than microcomputer.
* Uses multiprocessing and parallel processing technologies to solve complex problem faster.

**Usage: -**

* Used in scientific applications such as weather forecasting, oil explorations, research, Automobile industry, Aerospace Industry, Structural mechanics etc.
* The supercomputer develop in India is PARAM

1. **Differentiate between Static RAM and Dynamic RAM?**

Ans.

1. Differentiate between Sequential access device &direct access device?

Ans.**Sequential Access** to a data file means that the computer system reads or writes information to the file sequentially, starting from the beginning of the file and proceeding step by step.

On the other hand, **Random Access** to a file means that the computer system can read or write information anywhere in the data file. This type of operation is also called “Direct Access” because the computer system knows where the data is stored (using Indexing) and hence goes “directly” and reads the data.

Sequential access has advantages when you access information in the same order all the time. Also is faster than random access.

On the other hand, random access file has the advantage that you can search through it and find the data you need more easily (using indexing for example). Random Access Memory (RAM) in computers works like that.

**Section -C**

1. **Describe the secondary storage device? And explain its types in detail?**

Ans :Secondary Storage Devices

* Alternatively referred to as **External Memory**, **Secondary Memory**, and **Auxiliary Storage**, a **Secondary Storage Device** is a non-volatile device that holds data until it is deleted or overwritten.
* Computer usually uses its input/output channels to access secondary storage and transfers the desired data using intermediate area in primary storage.
* Most computers and users, secondary storage is required because of the need to permanently store some data to a computer.
* Secondary storage is about two orders of magnitude cheaper than primary storage.

Types Of Secondary Storage

* Hard Disk
* The hard disk drive is the main, and usually largest, data storage device in a computer.
* It can store anywhere from 80 Gigabytes to 10 Terabytes.
* Hard disk speed is the speed at which content can be read and written on a hard disk.
* A hard disk unit comes with a set rotation speed varying from 4500 to 7200 rpm.
* Magnetic Tape
* Tapes are used for recording and storing data for computer processing.
* It is made by a thin, magnetizable coating on a long, narrow strip of plastic film.
* A tape is usually ½” wide and upto 2400 feet in length.
* It is coated with particles of ferric oxide on which data can be recorded magnetically.
* Magnetic Disk
* Magnetic disk is another type of secondary storage device known as random (direct) access as it permits direct accessing of data.
* Data is recorded in the form of magnetized spots on the tracks of the disk, a spot representing the presence by “1” and its absence by “0” enabling representing of data in binary form.
* A Magnetic disk is made by a circular metal plate coated on both side by ferrous oxide material.
* CD-ROM
* CD-ROM (Compact Disc Read Only Memory) is a Compact Disc contains data accessible by a computer.
* Information of 650 MB can be stored which is equal to nearly 2,50,000 pages of printed text.
* CD-ROMs are popularly used to distribute computer software, including games and multimedia applications, though any data can be stored.

1. **Write a short note on the following:**

Ans :**Optical Disk**

* The data is stored on the disc with a laser or stamping machine, and can be accessed when the data path is illuminated with a laser diode in an optical disc drive which spins the disc at speeds of about 200 to 4,000 RPM or more, depending on the drive type, disc format, and the distance of the read head from the center of the disc (inner tracks are read at a higher disc speed).
* Optical discs are most commonly used for storing music, video, or data and programs for computers.
* Optical discs are usually between 7.6 and 30 cm (3 to 12 in) in diameter, with 12 cm (4.75 in) being the most common size.

**CD-ROM**

* CD-ROM (Compact Disc Read Only Memory) is a Compact Disc contains data accessible by a computer.
* Information of 650 MB can be stored which is equal to nearly 2,50,000 pages of printed text.
* CD-ROMs are popularly used to distribute computer software, including games and multimedia applications, though any data can be stored.
* Computers can read CD-ROMs, but cannot write to CD-ROMs, which are not writable or erasable.

**Secondary Storage VS. Primary Storage**

* The key difference between primary and secondary memory is that primary memory can be **directly accessed** by the CPU whereas, the CPU **cannot directly access** the secondary memory.
* The primary memory of the computer is also known as the **main memory** of the computer. However, secondary memory is known as **auxiliary memory**.
* The data that is to be **currently processed** is in primary memory whereas, the data that has to be **permanently stored** is kept in secondary memory.
* Primary memory is a **volatile memory** whereas, the secondary memory is a **non-volatile memory**.
* Primary memories are **semiconductor** memories whereas; the secondary memories are the **magnetic and optical** memories.
* Data accessing speed of the primary memory is faster than secondary memory.
* Primary memory is accessed by the **data bus**. On the other hand, secondary memory is accessed using **input-output channels**.
* Primary memory’s capacity is always smaller than secondary memory’s capacity.
* Primary memory is costlier than secondary memory.
* Primary memory is an **internal memory** whereas, secondary memory is an **external memory**.

**Mainframe VS. Supercomputer**

* Mainframes run multiple programs concurrently whereas Supercomputers focus processing power to execute a few programs or instructions as quickly as possible.
* Mainframes support many concurrent users whereas Supercomputers focus on speed and accelerated performance.
* Mainframes support new and legacy software (backwards compatibility) whereas Supercomputers push boundaries of what hardware and software can accomplish.
* Mainframes have performance measured in Millions of Instructions per Second **(MIPS)** whereas Supercomputers have performance measured in Floating Point Operations per Second **(FLOPS).**

**Impact Printer VS. Non-Impact Printer**

* Impact Printers work by banging the needle placed inside it on the ink ribbon that creates marks over the surface and then ink spreads throughout the paper, on the other hand, Non-Impact Printers work without any needle to produce scores get created over the surface and then ink spreads throughout the journal.
* Impact Printer has faster speeds around 250 words per second whereas Non-Impact Printers has slower speeds around 1 page per 30 seconds.
* Impact Printer produces characters and graphics on a piece of paper by striking whereas Non-Impact Printer produces characters and graphics on a piece of paper without striking.

**EDVAC(1946-52)**

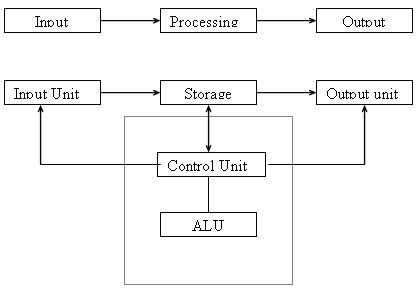
* EDVAC –Electronic Discrete Variable Automatic Computer used the stored program concept in its design.
* Programs were wired on board that made it difficult to change the program.
* Dr. John Von Neumann introduced the “Stored Program” concept.
* The sequence of Instructions and data can be stored in the memory of a computer for automatically directing the flow of operations .
* Influenced the development of modern computers because programs can be loaded and executed on the same computer.
* =“Stored Program Digital Computers”.

**EDSAC(1947-49)**

* Electronic Delay Storage Automatic Calculator, by Prof Maurice Wilkes et.al
* Developed at the Cambridge University.
* Considered to be faster than EDVAC.
* Addition operation took 1500 microseconds and multiplication operation took 4000 microseconds.

1. **Draw the block diagram of a computer? Explain each unit functions?**

**Ans :**



**InputUnit:**

Computers need to receive data and instruction in order to solve any problem. Therefore we need to input the data and instructions into the computers. The input unit consists of one or more input devices. Keyboard is the one of the most commonly used input device. Other commonly used input devices are the mouse, floppy disk drive, magnetic tape, etc. All the input devices perform the following functions.

• Accept the data and instructions from the outside world. • Convert it to a form that the computer can understand. • Supply the converted data to the computer system for further processing.

**Storage Unit:**

The storage unit of the computer holds data and instructions that are entered through the input unit, before they are processed. It preserves the intermediate and final results before these are sent to the output devices. It also saves the data for the later use. The various storage devices of a computer system are divided into two categories.

**1.Primary Storage:** Stores and provides very fast. This memory is generally used to hold the program being currently executed in the computer, the data being received from the input unit, the intermediate and final results of the program. The primary memory is temporary in nature. The data is lost, when the computer is switched off. In order to store the data permanently, the data has to be transferred to the secondary memory. The cost of the primary storage is more compared to the secondary storage. Therefore most computers have limited primary storage capacity.

**2. Secondary Storage:** Secondary storage is used like an archive. It stores several programs, documents, data bases etc. The programs that you run on the computer are first transferred to the primary memory before it is actually run. Whenever the results are saved, again they get stored in the secondary memory. The secondary memory is slower and cheaper than the primary memory. Some of the commonly used secondary memory devices are Hard disk, CD, etc.

**Memory Size:**

All digital computers use the binary system, i.e. 0’s and 1’s. Each character or a number is represented by an 8 bit code.

The set of 8 bits is called a byte. A character occupies 1 byte space. A numeric occupies 2 byte space. Byte is the space occupied in the memory.

The size of the primary storage is specified in KB (Kilobytes) or MB (Megabyte). One KB is equal to 1024 bytes and one MB is equal to 1000KB. The size of the primary storage in a typical PC usually starts at 16MB. PCs having 32 MB, 48MB, 128 MB, 256MB memory are quite common.

**OutputUnit:**

The output unit of a computer provides the information and results of a computation to outside world. Printers, Visual Display Unit (VDU) are the commonly used output devices. Other commonly used output devices are floppy disk drive, hard disk drive, and magnetic tape drive.

**ArithmeticLogicalUnit:**

All calculations are performed in the Arithmetic Logic Unit (ALU) of the computer. It also does comparison and takes decision. The ALU can perform basic operations such as addition, subtraction, multiplication, division, etc. and does logic operations viz, >, <, =, ‘etc. Whenever calculations are required, the control unit transfers the data from storage unit to ALU once the computations are done, the results are transferred to the storage unit by the control unit and then it is send to the output unit for displaying results.

**ControlUnit:**

It controls all other units in the computer. The control unit instructs the input unit, where to store the data after receiving it from the user. It controls the flow of data and instructions from the storage unit to ALU. It also controls the flow of results from the ALU to the storage unit. The control unit is generally referred as the central nervous system of the computer that control and synchronizes its working.

**CentralProcessingUnit:**

The control unit and ALU of the computer are together known as the Central Processing Unit (CPU).TheCPUis like brain performs the following functions:

•Itperforms all calculations

•Ittakesall decisions

•Itcontrolsallunitsofthecomputer

A PC may have CPU-IC such as Intel 8088, 80286, 80386, 80486, Celeron, Pentium, Pentium Pro, Pentium II, Pentium III, Pentium IV, Dual Core, and AMD etc.

1. Control Unit: It is responsible for directing and coordinating most of the computer system activities. It does not execute instructions by itself. It tells other parts of the computer system what to do. It determines the movement of electronic signals between the main memory and arithmetic logic unit as well as the control signals between the CPU and input/output devices.

2. Arithmetic logic Unit: ALU performs all the arithmetic and logical functions i.e. addition, subtraction, multiplication, division and certain comparisons. These comparisons include greater than, less than, equals to etc. The ALU controls the speed of calculations.

3. Registers: It is a special temporary storage location within the CPU. Registers quickly, accept, store and transfer data and instructions that are being used immediately (main memory hold data that will be used shortly, secondary storage holds data that will be used later). To execute an instruction, the control unit of the CPU retrieves it from main memory and places it onto a register. The typical operations that take place in the processing of instruction are part of the instruction cycle or execution cycle. The instruction cycle refers to the retrieval of the instruction from main memory and its subsequence at decoding. The process of alerting the circuits in CPU to perform the specified operation. The time it takes to go through the instruction cycle is referred to as I-time.

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1. **What is an output device? Explain some commonly used output devices.**

Ans :. Output devices allow computers to communicate with users and with other devices. This can include peripherals, which may be used for input/output purposes, like network interface cards, modems, IR ports, RFID systems and wireless networking devices, as well as mechanical output devices, like solenoids, motors and other electromechanical devices.

Some of the most common output devices that people:-

1. **Monitors-**Alternatively referred to as a video display terminal (VDT) and video display unit (VDU), a monitor is an output device that displays video images and text. A monitor is made up of circuitry, a screen, a power supply, buttons to adjust screen settings, and casing that holds all of these components.

Like most early TVs, the first computer monitors were comprised of a CRT (Cathode Ray Tube) and a fluorescent screen. Today, all monitors are created using flat panel display technology, usually backlit with LEDs.

1. **Speakers -**A speaker is a term used to describe the user who is giving vocal commands to a software program.

A computer speaker is a hardware device that connects to a computer to generate

sound. The signal used to produce the sound that comes from a computer speaker is

created by the computer's sound card.

1. **Printer-**A printer is an external hardware output device that takes the electronic data stored on a computer or other device and generates a hard copy of it. For example, if you created a report on your computer you could print several copies to hand out at a staff meeting. Printers are one of the most popular computer peripherals and are commonly used to print text and photos.
2. **Plotter-**A plotter is a computer hardware device much like a printer that is used for printing vector graphics. Instead of toner, plotters use a pen, pencil, marker, or another writing tool to draw multiple, continuous lines onto paper rather than a series of dots like a traditional printer. Though once widely used for computer-aided design, these devices have more or less been phased out by wide-format printers. Plotters are used to produce a hard copy of schematics and other similar applications.
3. D**efine memory? Explain different types of memory used in computers?**

Ans :. Computer memory is any physical device capable of storing information temporarily or permanently. Memory is divided further into different types:-

1. **Random Access Memory (RAM)**

* It is also called as read write memory or the main memory or the primary memory
* The programs and data that the CPU requires during execution of a program are stored in this memory
* It is a volatile memory as the data loses when the power is turned off
* RAM is further classified into two types- SRAM (Static Random Access Memory) and DRAM (Dynamic Random Access Memory)

2. **Read Only Memory (ROM)**

* Stores crucial information essential to operate the system, like the program essential to boot the computer
* It is not volatile
* Always retains its data
* Used in embedded systems or where the programming needs no change
* Used in calculators and peripheral devices
* ROM is further classified into 4 types- ROM, PROM, EPROM, and EEPROM

Types of Read Only Memory (ROM) –

**PROM** (Programmable read-only memory) – It can be programmed by user. Once programmed, the data and instructions in it cannot be changed

**EPROM** (Erasable Programmable read only memory) – It can be reprogrammed. To erase data from it, expose it to ultra violet light. To reprogram it, erase all the previous data

**EEPROM** (Electrically erasable programmable read only memory) – The data can be erased by applying electric field, no need of ultra violet light. We can erase only portions of the chip

**3. Cache Memory**

Cache memory provides faster data storage and access by storing instances of programs and data routinely accessed by the processor. Thus, when a processor requests data that already has an instance in the cache memory, it does not need to go to the main memory or the hard disk to fetch the data.

Cache memory can be primary or secondary cache memory, with primary cache memory directly integrated into (or closest to) the processor. In addition to hardware-based cache, cache memory also can be a disk cache, where a reserved portion on a disk stores and provides access to frequently accessed data/applications from the disk.

1. **Describe the applications of computer in detail?**

Ans :The various application areas of computer are described below:-

**Education:**

Computer is a very effective tool which can be used for teaching and learning, result processing, student data processing, question preparation, handouts and note preparation, etc. and also online education. Many universities provide online education through internet. The learning materials are packed in CD-ROM with interactive multimedia. The CAL (Computer Aided Learning), CAI (Computer Aided Instruction), multiple choice examination paper, result processing are done through internet.

**Industries:**

Industrial research, budgeting, process control, all are computer based. The robotics are also computer based. Nowadays robots are used in complicated industrial process which is dangerous for human. CAD (Computer Aided Design) is used in manufacture sector to design model of electrical, electronics, mechanical models of machines and it is more popular among architect engineers also. CAM (Computer Aided Manufacture) and CADMPT (Computer Aided Design, Process, Manufacture and Testing) are also more popular terms in industries.

**Banking and Financial Company:**

Computers are used in bank for electronic money transfer, voucher, ledger, bank sheet, etc. different systems are used in Financial Company such as ATM (Automatic Teller Machine), EFTS (Electronic Fund Transfer System) etc. which is computer based systems for customer services provided by banks.

**Hospital:**

The research in health is done with the help of computer. It is applied to medicine, surgery and research. The multimedia kits for surgeon are also available to learn surgery on virtual patients. The concept of expert system is also introduced in computer system which is a computer program designed to operate at the level of expert in particular field.

**Science and Engineering:**

For every branch of engineering, computer is considered as a strong tool like civil, electrical and computer to aeronautic, ceramics, chemical and leather technology. the study of electric circuit, motherboard, building models, machine designs and models are taught very effectively through computers.

1. **What do you mean by printer? Illustrate the various types of printer?**

Ans :.A printer is an external output device that takes data from a computer and generates output in the form of graphics / text on a paper.

**Impact printers**

An impact printer makes contact with the paper. It usually forms the print image by pressing an inked ribbon against the paper using a hammer or pins. Following are some examples of impact printers:-

**Dot-Matrix Printers**

The dot-matrix printer uses print heads containing from 9 to 24 pins. These pins produce patterns of dots on the paper to form the individual characters. The 24 pin dot-matrix printer produces more dots that a 9 pin dot-matrix printer, which results in much better quality and clearer characters. The general rule is: the more pins, the clearer the letters on the paper. The pins strike the ribbon individually as the print mechanism moves across the entire print line in both directions, i-e, from left to right, then right to left, and so on. The user can produce a color output with a dot-matrix printer (the user will change the black ribbon with a ribbon that has color stripes). Dot-matrix printers are inexpensive and typically print at speeds of 100-600 characters per second.

**Daisy-wheel printers**

In order to get the quality of type found on typewriters, a daisy-wheel impact printer can be used. It is called daisy-wheel printer because the print mechanism looks like a daisy; at the end of each “Petal” is a fully formed character which produces solid-line print. A hammer strikes a “petal” containing a character against the ribbon, and the character prints on the paper. Its speed is slow typically 25-55 characters per second.

**Line printers**

In business where enormous amount of material are printed, the character-at-a-time printers are too slow; therefore, these users need line-at-a-time printers. Line printers, or line-at-a-time printers, use special mechanism that can print a whole line at once; they can typically print the range of 1,200 to 6,000 lines per minute. Drum, chain, and band printers are line-at-a-time printers.

**Drum printer**

A drum printer consists of a solid, cylindrical drum that has raised characters in bands on its surface. The number of print positions across the drum equals the number available on the page. This number typically ranges from 80-132 print positions. The drum rotates at a rapid speed. For each possible print position there is a print hammer located behind the paper. These hammers strike the paper, along the ink ribbon, against the proper character on the drum as it passes. One revolution of the drum is required to print each line. This means that all characters on the line are not printed at exactly the same time, but the time required to print the entire line is fast enough to call them line printers. Typical speeds of drum printers are in the range of 300 to 2000 lines per minute.

**Chain printers**

A chain printer uses a chain of print characters wrapped around two pulleys. Like the drum printer, there is one hammer for each print position. Circuitry inside the printer detects when the correct character appears at the desired print location on the page. The hammer then strikes the page, pressing the paper against a ribbon and the character located at the desired print position. An impression of the character is left on the page. The chain keeps rotating until all the required print positions on the line have filled. Then the page moves up to print the next line. Speeds of chain printers range from 400 to 2500 characters per minute.

**Band printers**

A band printer operates similar to chain printer except it uses a band instead of a chain and has fewer hammers. Band printer has a steel band divided into five sections of 48 characters each. The hammers on a band printer are mounted on a cartridge that moves across the paper to the appropriate positions. Characters are rotated into place and struck by the hammers. Font styles can easily be changed by replacing a band or chain.

**Non-impact printers**

Non-impact printers do not use a striking device to produce characters on the paper; and because these printers do not hammer against the paper they are much quieter. Following are some non-impacted printers:-

**Ink-jet printers**

Ink-jet printers work in the same fashion as dot-matrix printers in the form images or characters with little dots. However, the dots are formed by tiny droplets of ink. Ink-jet printers form characters on paper by spraying ink from tiny nozzles through an electrical field that arranges the charged ink particles into characters at the rate of approximately 250 characters per second. The ink is absorbed into the paper and dries instantly. Various colors of ink can also be used.

One or more nozzles in the print head emit a steady stream of ink drops. Droplets of ink are electrically charged after leaving the nozzle. The droplets are then guided to the paper by electrically charged deflecting plates [one plate has positive charge (upper plate) and the other has negative charge (lover plate)]. A nozzle for black ink may be all that’s needed to print text, but full-color printing is also possible with the addition of needed to print text, but full-color printing is also possible with the addition three extra nozzles for the cyan, magenta, and yellow primary colors. If a droplet isn’t needed for the character or image being formed, it is recycled back to its input nozzle.

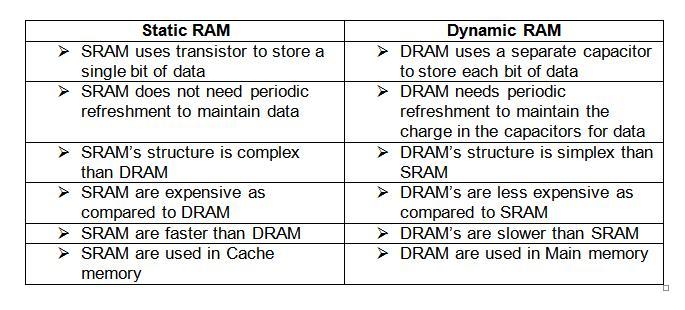
**Laser printers**

A laser printer works like a photocopy machine. Laser printers produce images on paper by directing a laser beam at a mirror which bounces the beam onto a drum. The drum has a special coating on it to which toner (an ink powder) sticks. Using patterns of small dots, a laser beam conveys information from the computer to a positively charged drum to become neutralized. From all those areas of drum which become neutralized, the toner detaches. As the paper rolls by the drum, the toner is transferred to the paper printing the letters or other graphics on the paper. A hot roller bonds the toner to the paper.

Laser printers use buffers that store an entire page at a time. When a whole page is loaded, it will be printed. The speed of laser printers is high and they print quietly without producing much noise. Many home-use laser printers can print eight pages per minute, but faster and print approximately 21,000 lines per minute, or 437 pages per minute if each page contains 48 lines. When high speed laser printers were introduced they were expensive. Developments in the last few years have provided relatively low-cost laser printers for use in small businesses.

1. **List out at least 5 difference between static RAM and Dynamic RAM? Explain in detail?**

**Ans:**



**Dynamic random access memory (DRAM)** is a type of memory that is typically used for data or program code that a computer processor needs to function. DRAM is a common type of random access memory (RAM) used in personal computers (PCs), workstations and servers. Random access allows the PC processor to access any part of the memory directly rather than having to proceed sequentially from a starting place. RAM is located close to a computer’s processor and enables faster access to data than storage media such as hard disk drives and solid-state drives.

**SRAM (static RAM) is random access memory** (RAM) that retains data bits in its memory as long as power is being supplied. Unlike dynamic RAM (DRAM), which stores bits in cells consisting of a capacitor and a transistor, SRAM does not have to be periodically refreshed. Static RAM provides faster access to data and is more expensive than DRAM. SRAM is used for a computer's cache memory and as part of the random access memory digital-to-analog converter on a video card.