COMPUTER APPLICATION

* **COMPUTER** :- It is an ~~elec~~ electronic device which accepts data as input, processes the data as per the instruction of the user and produces data as output.

[Commonly Operates Machine Particularly used for Technical & Process Purposed Under ~~Technical~~ Eductation Research.]

* **Advantage** :- (i) Better job oppurtunity.
  (ii) Benefits of works at any time.
  (iii) Improvement of product.
  (iv) Better service of people.

* **Disadvantage** :- (i) Lack of commonsense
  (ii) Inability to correct
  (iii) Depends upon human being.
  (iv) portability.

* **Feature** :- (i) Speed :- Computer have a tremendous speed.
  (ii) Volume :- The Large volume of data in a coverage capacity.
  (iii) Accuracy :- Input data and output the results is accurate.
  (iv) Storage :- Data can be store in Memory

* Generation of Computer :-

(1) 1st generation :- (1942-1955)
Software components is Vacuume Tube.

(2) 2nd generation :- (1956-1965)
Software components is Transistor.

(3) 3rd generation - (1966-1975)
Software components is I.C. (Integrated Circuit)

(4) 4th generation - (1976-1985)
Software components is VLSIC.
(Very Large Scale Integrated Circuit)

(5) 5th generation - (1986 - till now)
Software components is MP.
(Microprocessor)

* Classification of Computer :-

Computer classified broadly into 3 types,

(I) Analog computer
(II) Digital computer
(III) Hybrid computer

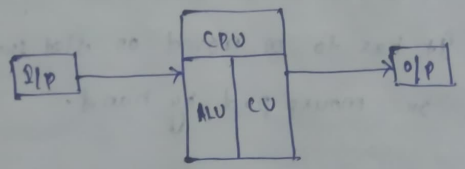
→ Analog computer :- These type of computers work on principle of measurement of continuous changes in physical qualities like pressure, temperature, speed, voltage etc.

→ Digital computer :- These type of computers work on the principle of counting discrete numbers known as Binary numbers. Accuracy is very high in Digital Computer. The cost is also high.

→ Hybrid computer :- It is the both feature of analog & digital computers.

* Von-Neumann Architecture :-

(Block Digram of computer)



This Architecture developed by Scientist John neu-mann.

There are four major units ;

→ Input unit
→ output unit
→ CPU (central processing Unit)
→ Memory unit.

→ Input device :-

(i) Keyboard – In the keyboard the keys are arranged in Matrix form having rows and columns.

The keys in the keyboard are grouped into these categories.

→ Alphabetic key – (A → Z)

→ Numeric key – (0 → 9)

→ control key – (ctrl, Alt, Del, Esc, etc)

→ function key – (F_1 – F_{12})

(ii) Mouse :- It is called pointing device. It is association with VDU (visual Display Unit). It has to be moved on flat surface of table or mouse pad by hand.

(iii) Light pen :- It is also a pointing device. It is used in association with VDU. It is a pen like structure. The pen will have to be moved on monitor screen. It is used for selecting option from a menu. It is also used for graphics work.

OMR :- (Optical Mark Reader)

It is used in computer which can read marks on papers. It is a marking device which is used in question sheet and answer sheet. Also used in present or absent format through the computer system.

MICR :- (Magnetic Ink character Reader)

It is used in back-up chip. It is used in which have 10 digits of special character are available. It is currently used in debit card, ATM card.

OCR :- (optical character Reader)

Which can be accept data in a laser light of a particular device. It is the electronic translation of images of handwritten or type-written text into machine editable text.

Scanner :- It is also a input device, that optically scan images, printed text, or an objects and coverts it to a digital image. This creates an electronic version of document that can be viewed and edited on a computer.

→ Output device :- some of output devices are VDU (visual display unit).

[i.e Monitor, printer, speakers, plotters]

Monitor :- that displays information in pictorial form. It used for data processing while television sets were used for entertainment.

In generally there different types of monitors;

→ CRT (Cathode Ray Tube)

→ LCD (Liquid Crystal Display)

→ LED (Light Emitting Diodes)

→ TFT (Thin film Transistors)

* **Printer :—** It is an output device, in which we can print a document, or convert softcopy to hard copy. Classified into two categories;

• Impact printer :— Directly touch on a paper. It moves right to left or left to right position on a printing paper.

• Non Impact printer :— This type of printer can be used in a Laser beam. The beam can be flashout a mirror glass, then print on paper. This print quality is very high resolution for a printed fo cost of non-impact printer is high. These are mos used with personal computer.

* **Plotters :—** A plotter is a printer that interpret commands from a computer to make line drawi on paper with multiple pens. It is widely use for computer-aided design.

It is much expensive than traditional printer.

CPU :— (Central processing Unit)

It consist of ALU & CU. (Arithmatic Logic Unit) & (control unit)

Besides ALU & CU, it also contain of high speed storage elements called Registers.

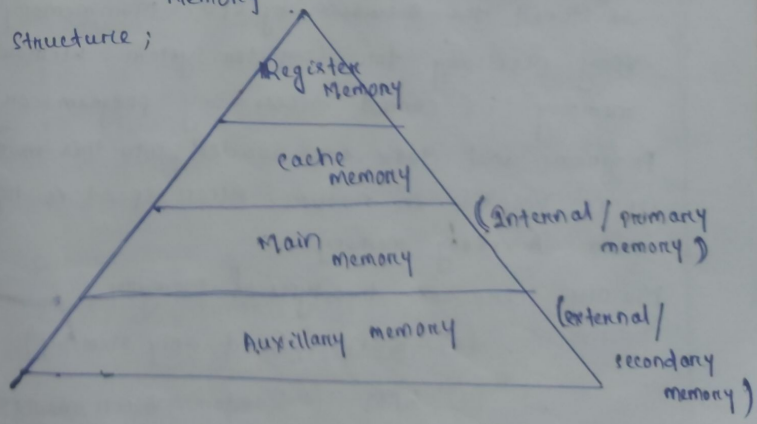
It is also known as Brain of computer.

ALU :— Arithmatical Logical unit perform the various arithmetic operations such as Addition, Substraction, Division, Multiplication & Logical operation also.

CU :— Control Unit sends out command and control signal and determines the sequence of various instructions.

MEMORY :— Memory in which we can store data and program during execution, & also for future reference.

Memory is classified in hierarchical structure;



→ Register Memory :— It is integrated / inbuilt inside the CPU. This is a small memory capacity used for store data temporarily.
Some important register present inside the CPU that are
- Accumulator
- PC (program counter)
- MAR (Memory Address Register)
- MDR (Memory Data Register)
- IR (Information Register)

→ Cache Memory :— It is also a small memory, situated inbetween Register memory and main memory. This is used for storing frequently used program and data. This memory can be hold or store data from main memory location during execution. When the process needs to read or write in main memory, it first check whether data is copy in cache memory or

→ Main memory :— This is the memory where program is stored for execution by CPU. Main memory is very necessary for computer system. Without main memory we cannot access any program or data. Programs and data are loaded into this memory. It is volatile in nature. Access speed is higher than Auxillary memory.
Mainly there are two types of Memory ;
(i) ROM (Read only Memory)
(ii) RAM (Random Access memory)

(i) Read only Memory :—
In this memory only read operation is possible. The contents of this memory is written by the manufacturer. It is not volatile in nature.
There are three types of ROM ;
→ PROM :— (Programmable Read only Memory)
User can ~~program~~ read programmable data only once, through the device.

→ EPROM :— (Erasible programmable Read only Memory)
User can erase the programmable data one by one byte. It both erase and read the data through the memory.

→ EEPROM :— (~~Erasible~~ Electrically Erasible Programmable Read only Memory)
User can erase the data one by one byte through electronic process.

(ii) RAM :— (Random Access Memory)
In this memory both read & write operation is possible. This is volatile in nature.
RAM is two types ;
→ SRAM :— (Static RAM)
Data is lost when power is off. It is a non-changable device, always power can be supply.
→ DRAM (Dynamic RAM)
It is a changable Ram, which works and process the data automatically.

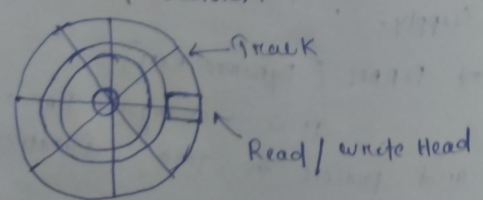
SRAM	
→ It uses transistor to store a single bit of data.	→ It uses separate c to store each bit o
→ Its structure is complex than DRAM.	→ Its structure is than SRAM.
→ Expensive as compared to DRAM.	→ Less expensive as SRAM
→ Faster than DRAM.	→ Slower than SRA
→ Used in cache Memory.	→ Used in Main me
→ Non-chargable RAM	→ Chargable RAM.

→ **Auxillary Memory :-**

It is the extra storage capacity through com system. This memory can be used outside the c Access speed is very less. It stores data perman until it is erased by user.

It is also known as secondary or external mem There are different types of memory (auxillary)

(i) **Magnetic Disk :-** It is a circular p made of metal or plastic coated. Input s which may be audio, video or data are recorde the surface of a disk as magnetic patterns spot in spiral tracks. Tracks are commonly d into sections called sectors.



(ii) **Floppy Disk :-** It is a erasible media, data can be transferred one place to another. It is square in size, i.e 3.5 inch. And memory capacity is 1.44 Mb. These are cheaper to use and portability is its major advantages.

(iii) **Optical disk :-** Data access is performed by a high power laser beam on surface. Two types of Optical disk ;

→ WORM disk - (write only Read memory)

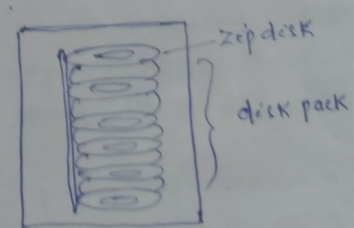
- Data can be written by user but only once. It cannot be erased subsequently.

→ CDR :- (compact disc Recorder)

It is similar to music CD. It is only Read facility not write. Once data can written, then it cannot be erased.

So Both WORM & CDR disk are same.

(iv) **Hard disk :-** We know all data can be store in Hard disk, it is metal square in size. Inside the Hard disk zip disk are available. Collection of zip disk is known as diskpack. Hard disk is normally faster device and has capacity very high. Presently hard disks are having capacity several GB and several TB.



FLOPPY DISK

→ A Light storage device → Heavy than floppy de
→ storage capacity is less → storage capacity very
→ Data access time is more. → Data access time is
→ cheap storage medium → costly storage medi

Data :— Collection of all facts, figures or description of an objects.

Ex:- If students is an Rollno, name, These are data of a students.

Information :- The data which gives a meaning results.

Ex:- The students with name gives h address with contact number. These are information of a stud

SOFTWARE

A computer system mainly comprises two categories, i.e Hardware & software. Hardware refers to all physical components presents in computer which we can touch. Similarly software refers to set of programs which make the Hardware operational.

Software is the collection of programs or instructions which is given by Hardware. which we can access, but not interchangable.

Software can be classified into three categories;

(a) Service Software

(b) system software

(c) Application software

(a) System Service software :— By which we can ~~provi~~ use different service of computer system. This is classified into several categories;

→ compiler :— It is a program that translate source code into object code.

Or

Translate source code written in high level language (c++) into a set of machine language instructions that can be understand by digital computer's. All programs are compile at a time, it is used in more memory space, and very high speed processors.

(b) Interpreter :-

An interpreter is a program that executes programming code directly. It can convert source code on a step by step or line by line into machine code.

Or

It is a program that translates and execute instruction written in a computer programming language line by line step.

→ Assembler :-

It is a program that converts assembly language into machine code. It takes basic commands and operations from assembly code and converts into binary code.

[assembly language is known as low level language] 'C'

[Machine code is machine language instructions is a low level programming language used to directly control CPU.] (10101 - Ex)

→ Loader :-

A loader is a program that places programs into memory and prepare them for execution.

Generally we can say loader is a program that is responsible for loading programs inside the memory and prepares them for execution.

→ Locator :- It locate the data from address of a file or folders inside the memory.

→ Debugger :- It is a program used to test and find bug (error) in other programs. A debugger is also known as a debugging process.

→ Editor :- It is a program that enable the user to create, modify, edit and delete text files.

SYSTEM SOFTWARE :-

A set of programs, which are designed to control the operation of computers hardware and support it for error free computation is known as system software.

following activities are;

→ It provide a platform for installation and development of application software.

→ It facilitates the execution of a program written in high level language.

Some common system softwares are;

Operating System, Language processor, Device Drivers, Utility programs, etc.

→ Operating System :- It is a system software, which is responsible for managing various computer resources. It also provides a platform to user for loading application software.

OR

It is a software, which is installed in a computer to act as an interface between computer & human user. (Ex :- Android, xp, vista, Window 7, 8, 10)

→ Language processor :- which is responsible for translating and interpreting the program written by using programming language.

Ex :- Compilers, interpreters, Assemblers.

→ Device Drivers :- which is used to establish an error free and easy communication between device & computer.

→ Utility programs :- Generally used for system maintainance activity. which is directly capable of directly interacting with computer hardware.

Ex :- disk format, disk backup utility.

Application Software :-

It is commonly defined as any programs or number of programs designed for end user.

Ex :- Graphics, word processor, spread sheet, web browsers etc.

→ Web browsers :- Google chrome, internet explorer and also include firefox, ms edge, etc.

Graphics :- It means Graphical User Interface (GUI). It is used for window base system.
(Visual image) (Excels word graphics (means drawing)
Word processor :- It means MS-WORD (Microsoft word).
Notepad, Oracle database software, MS-access.
Spread sheet :- It means electronic spreadsheet, in which number of rows i.e 65,636 and no. of columns i.e 256 are present. It is used in database system which can be calculate, sum, multiply, divide, d module, drag, etc.

(1) OPERATING SYSTEM :-

Which is an interface between user and system, without operating system computer is nothing like a box.

It is a program or group of programs which execute in the system through the users.

* **Functions :-** (i) An operating system load to require programs in the memory and when it need to execute.

(ii) It controls the data or any application on storage device, like Hard disk, floppy disk, etc

(iii) Some operating system maintain the security.

* **Objective of O.S :-** There are three types of objective can be observed.

→ **Convenience :-** to do something easily with little effort.

→ **Efficiency :-** ratio of useful work to resources.

→ **Ability :-** talent, capacity or capability etc.

Purpose of Operating System :-

→ **Program execution :-** When the user wants to run an application or program, it must be communicate with an O.S. In this process it consist number of command i.e known as system command.

→ **I/O operation :-**

A running program may require I/O. This I/O may involve a file or an I/O device. If a user cannot execute an I/O operation directly, the operating system must provide the means to do so.

→ **Memory Management :-** In this process operating system allocate memory to itself. The user particular to arrange the data through input device and store in memory for special purpose.

→ **Process Management :-** It concerned to which allocating the CPU with various process to ensure maximum output from the system.

It keeps the tracks of process resource. Such as;

(i) Terminate a process
(ii) Assign / change a process
(iii) Block / allow a process
(iv) Suspend a process
(v) Delay a process

This operating system is simple for a single user, but it becomes complicated for multiuser.

→ **Information management :-** In this process it involves activity to direct command / interaction by user. Following some activities are;

(i) Create of file
(ii) open a file
(iii) Read / write the data from / to the file.
(iv) Maintain file status

In this process, it also involves track of different files & maintain the data to store in a "file directory structure". (organization of file in a hierarchical structure)

→ House keeping :—

It includes all types of service which necessary to ensure smooth operation of computer system. Such as ~~security~~, Security, protection, back up, restore on recovery etc.

* CATEGORY OF OPERATING SYSTEM :—

→ Single-User Single Task :— In this system only one user can work at one time. The computer will have one CPU and one terminal. Ex :- DOS.

→ Single User multi task :- In this system one user can works several programs at same time.

Ex :— It's possible for window user that to be writing a note in a word processor while downloading a file from internet while printing text of an email message.

→ Multiuser Multitask :— In this system more than one user can work simultaneously. Computer have one or more CPU and a number of terminals. Each user can work in terminal.

Ex :- UNIX, XENIX, etc.

* TYPES OF OPERATING SYSTEM :—

(1) Batch processing :— This system supports processing of jobs at one time. The jobs are submitted in batch. It is the responsibility of operating system to scheduled the jobs in a queue and assign them one by one. It is also used for bulk of database to update and automatic transaction processing.

(2) Multiprogramming System :— It is a draw back of batch processing system. It is a technique used to ~~add~~ utilize maximum CPU time by running of multiple

simultaneously. In this system the programs are loaded in computer memory. OS execute begins the first program & continue till an instruction waiting for a peripheral reach. And the process will continue until the program are finished.

(3) Multiprocessing System :— In this system all programs processing unit may be equal for special purpose. It able to run several programs concurrently. Unix is the most important part of multiprocessing system.

(4) Time sharing system :— This operating system make time slice of CPU, and distribute multiple user seating at various terminals. This system allow the user to share the time simultaneously. Each user is allocated resources for a particular time slot.

(5) Real Time Operating System :— In this system, processing is done immediately when i/p is available. Data are entered into system and things are occur. The processor takes a decision with fixed time.

It is also a multitasking operating system intended for real time application. Such applications included embedded system, industrial robots, spacecraft, industrial control and scientific research equipments.

(6) Multitasking operating system :— In this system only one CPU is involved, but it supports multiple tasks at same time.

Ex :- the computer can perform processing activity, it can send the output data to a printer and print, it can send the files to any external device for store, etc.

(7) Network operating system :— That includes special function for connecting computers and devices into a LAN (Local area Network). It controls a network and its message.

* FEATURES OF DOS, WINDOW & UNIX :-

DOS :- (DISK OPERATING SYSTEM)

It was first widely installed operating sy for personal computers. It developed for IBM by Bill gates. He create a new version ~~in market~~ of microsoft in market i.e called MS-DOS.

Dos translate the command issued by user, i.e understandable by computer and work according

Function :- Manage disk files, allocate system accordi to the requirement.

It provide to control hardware devices such as keybo screen, disk devices, printers, Modems and programs

Features :- (1) It is a single user operating system.
(2) It supports batch processing concept.
(3) It supports 640 KB, or higher memory.
(4) It maintain hierarchical file system.
(5) It is a command base operating system
(6) It requires low amount of primary memor for installation & running.

There are two types of commands available in Dos.

→ Internal commands :-

cd - To display the name or change current direc	
md - Make a directory	
cls - Clean screen	
Dir - display directory contents	Exit - quits
rd - Remove / ~~delete~~ delete	command
Ren - Rename a file / directory	
type - content of a text file	
date - sets current date	
time - sets current time	
ver - version of Dos	
copy - copy one or more	

→ External commands :-

diskcopy.com - copy one disk to another.
attrib.exe - read write execute attribute a file
tree.com - file structure in a tree manner.
backup.exe - Create backup file from hard disk to floppy disk / or any disk, device.
more.com - display screen by screen
label.exe - creates, changes, delete the volume label of a disk.
Restore.exe - Restore files from backup disk.
print.exe - print a file
find.exe - search for file
start.exe - Runs a window or Dos programs.

WINDOWS :-

It is a series of software operating system. And also known as Graphical User Interface. (GUI).
First version of window operating system is version 1.0 released on 20 november 1985.

Feature :- GUI - Graphical User Interface
Desktop - screen (monitor screen)
Icon - Graphical symbols on screen
Folder - User can create, name, remove it. Directory in Dos.
Frame - side view, boundary
Task bar
Title bar
Scroll bar
Tool bar
minimize, maximize & close
Dialogue box
My computer
Recycle bin
control panel
Explorer

GUI operating system operate by mouse.

UNIX :— It is a multiuser, multi... Developed in 1969 at AT&T bell lab by Ken Thompson, Dennis Ritchie, Douglas McIlroy, & Joe Ossanna.

It organized at three levels;

→ Kernel (which schedules tasks & manage storages)

→ The shell (which connects and interrupts user's commands from memory and executes them)

→ Tools & application (It offers additional functionality to O.S)

Features :- (i) Portability

(ii) Machine Independence

(iii) Multi user operation

(iv) hierarchical file system

(v) Background processing

(vi) software development tools

(vii) pipes & filters

(viii) Security

Commands :-

cp – copy a file

Lp – Print a file

cd – change directory

Mkdir – To create

rmdir – delete directory

date – print date

who – current user

cat – creating & display file

chmod – Change permission of file

Vi – Involves editor to edit a file

Pwd – print working directory

DIFFERENCE BETWEEN DOS & WINDOWS & UNIX

~~Q3 → WHAT IS MEMORY :- DESCRIBE CLASSIFICATION OF MEMORY :-~~

Ans :-

DOS	WINDOWS
(1) It is command user Interface	(1) It is Graphical user Interface
(2) It is a less powerful & slow O.S	(2) It is powerful and fast O.S
(3) All commands available in Window are not in DOS.	(3) All DOS commands available in WINDOW.
(4) It doesn't provide multitasking environment	(4) It provides multitasking environment.
(5) It supports only commands.	(5) It supports Graphics.

UNIX	DOS
(1) It is a powerful O.S.	(1) It is less powerful.
(2) Multitasking & Multiprogramming is possible in UNIX	(2) It doesnot support multitasking & multiprogramming
(3) supports visual display & Graphics	(3) Doesnot support VD & graphics
(4) It can support networking of computers.	(4) Doesnot support networking of computers
(5) It support login concepts & therefore provide high security level.	(5) Doesnot provide security level.

NETWORKING

* **Introduction:-**

A network consists of two or more computers that are linked in order to share resources, exchange files. The computer on a network may be linked through the cables, telephone lines, radio waves, satelites etc.
The communication links which is physically connected with devices is known as networking.

* **Goals of Network:-**

→ **Resource sharing:-** It is the major goal of computere network. Through computer network the various resources like data, programs, files utilized at a ~~distance~~ distant place.
Therefore, programs donot need to run on a single device.

→ **Job sharing:-** A number of jobs divided into a small module and distributed to various computers present in a network.

→ **Achieving reality:-** In a network system if a system failure then we can used another system which is present in a network to ~~obtain~~ attained on going jobs.

* **Types of Network:-**

Generally we know three types of networks; i.e (1) LAN
(2) WAN
(3) MAN

(1) **LAN:-** (Local Area Network)

It consist of a network of reasonable small number of computers which is present inside some area. It is a small geographical location. The data transfer rate is very high speed. A LAN is established by wire media. The cost of communication is very less.
In LAN two different mode of communication;
→ "peer to peer" it is carried out from one system to another.
→ "client/server", in which central system provides network services to users.

(2) **WAN:-** (Wide area network)

It is a network having a computer which are physically located at many distance from each other. It is established through satelite link. It spread large geographical location. Data transmission ~~date~~ rate is very low, with wireless media, and also cost of communication is very high.

(3) **MAN:-** (Metropolitan Area Network)

This type of network spread over large geographical location. In this case data transmission path ~~is~~ is in wave media.

DIFFERENCE

LAN	WAN
(1) It is small geographical location.	(1) It spread large geographical location.
(2) Data transmission rate is high.	(2) Data transmission rate is lower than LAN.
(3) It established by wired media.	(3) It established by wireless media.
(4) Cost of communication is less.	(4) Cost of communication is high

Mode :-

The way in which data is transmitted from one place to another is called data transmission mode. It is also called data communication mode.

There are three types of transmission modes;

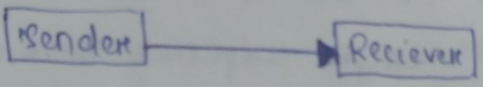
(I) Simplex mode

(II) Half-duplex mode

(III) Full-duplex mode.

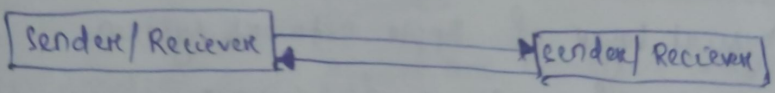
(I) Simplex mode :- Data can flow in only one direction. A sender can only send data and cannot recieve it. Similarly a reciever can only recieve data but cannot send it.

Ex:- Data sent from computer to printer.



(II) Half duplex mode :- Data can flow in both directions but only in one direction at a time. Means data is sent and recieved alternatively.

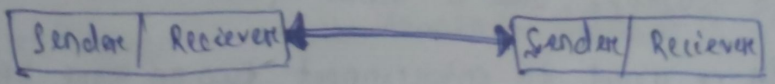
Ex:- a one-lane bridge where two way traffic must give way in order to cross other.



(III) Full duplex :- Data can flow in both direction at same time. It is the fastest directional mode of data communication.

Ex:- Two persons can talk at the same time.

Another a two lane road, traffic can move in both direction at same time.



* PROTOCOL :- A protocol is a set of rules that governs the communication between computers on a networks. Access method, physical topology, cabling, and speed of data transfer is some characteristics of protocol.

There are different types of protocol ;

→ Ethernet
→ Local talk
→ Token Ring
→ FDDI (Fiber distributed Data Interface)
→ ATM (Asynchronous Transfer mode)

→ Ethernet :- It is the standard way of connecting computers together in on a network over a wired connections. i.e use of LAN.
It provides multiple computers have access to it and can send data at any time.
It can be based on twisted pair or fiber optics cable.
The data transfer rate is 100 mb/sec.

→ Local talk :- It is a particular implementation of physical layer of Apple network system.
Data transfer rate is 230.4 kb/sec.

→ Token Ring :- It is a communication protocol used in LAN. It used in Ring topology, which is devices are connected to one another in a single ring.

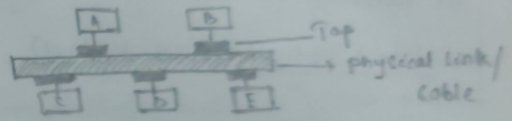
→ FDDI :- It supports data transfer speeds is 100 mbps over a fiber optics cable.
It is used to interconnect two or more LAN, over large distance. It also used dual ring topology.

→ ATM :- It is a telecommunication for digital transmission of multiple types of traffic, including telephony, data, & video signals in one network without the use of separate network.

TOPOLOGY

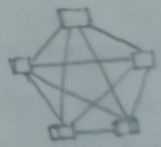
Defination :- It is the way of arrangement of links, systems, nodes on a physical path of a communication networks.
Physical path may be cable and other peripherals.
There are five types of topology ;

→ Bus topology :-



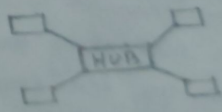
On the above diagram, devices are connected to a common cable. A device communicate to other device with the help of Bus structure. It basically of a parallel base.

→ Mesh Topology :-



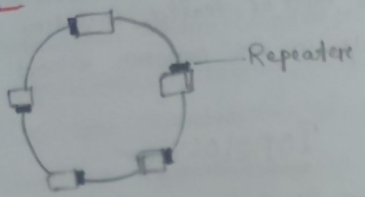
In this topology each devices are connected with each other with individual link.

→ Star topology :-



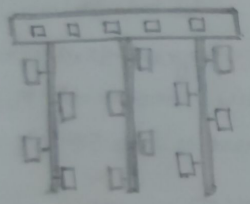
In this topology it support multiple communication. Each system are directly connected to a central switch known as HUB. It doesnot allowed to direct traffic between the device. When a device transmit data it is control through HUB, than transmit to other device.

→ RING Topology :-



On the above diagram devices are connected in a ring structure. These are connected point to point only, this point is known as Repeater. In which signal receive data on links and transmit to another links for recieving of destination point.

→ Hybrid Topology :- (Tree topology)



This topology is combination of Bus and Star topology. All devices are connected with a central switch i.e HUB and also connect with a Top which is like as Bus topology.

* NETWORKING DEVICES :-

In networking there are many devices which we can use for communication of data, messages, informations etc.

These are; HUB, Repeater, Switches, Bridges, Routers, Gateways, NICs (Network interface card).

* HUB :- It is basically known as multiport repeater. A Hub connects multiple wires coming from different branches. Hub cannot filter data, so data are sent to all connected devices.

There are two types of Hub;

→ Active Hub :- which have own power supply and clean, boost, and relay the signal.

→ passive Hub :- which collecting power supply from active Hub. This hub relay the signal without clean, boosting them.

* REPEATERS :- It donot amplify the signals, when the signals become weak, they copy the signal bit by bit and regenerate it original strength. It is a 2 port device.

* Switches :- A switch must be able to read MAC address. A switch is a data link layer device. It can perform error checking before forwarding data.

* Bridges :- A bridge in a computer network is a device, used to separate a network into sections. It is used in OSI model, at Layer-2 namely data link layer. It is to examine the incoming traffic and examine whether to filter it or forward it.

* ROUTERS :- It is a device that forward data packets between computer networks. It connect different networks together and send data packets from one network to to other. A router can be used both in LAN & WAN.

* GATEWAYS :- It is a device used to connect network using different protocols. It may be a router, firewall, server, or other device that enables traffic to flow in and out of network.

* NICs :- (Network Interface Card)

It is a computer hardware component that connects a computer to a computer network. It controls wired and wireless connection of a ~~computer~~ computer to exchange information with other system. It may be Network adapter, LAN adapter or any physical network interface.

* Internet Services :-

In Internet connection, there are various kind of way which we use for communicating, transferring data, files and informations.

→ E-mail :- (Electronic Mail)

It is a method of exchanging messages between people using electronic devices.

An electronic mail message consist of two components; (1) Message Header, & (2) Message body.

Advantage :- The message sent through e-mail costs very low. It is very very cheaper than courier, fax or telegram.

E-mail can be sent very fast. It is very easy to use on internet. It saves our time. A lot of paperwork is saved for reduces file maintenance.

→ FTP :- (File Transfer Protocol)

It is a protocol which is used for transfer of files between a client and server, on a network.

Advantage :- It allows us to transfer multiple directories at one time.

→ WWW :- (World Wide Web)

It refers to collection of information i.e access on internet. The information is in form of text, pictures, and sound. This web is a very popular service on the internet. It is prefixed before the address of any website.

→ HTTP :- (HyperText Transfer Protocol)

It is used to transfer data in internet. It is allow the fetching of resources, such as HTML documents. It is a client-server protocol, which is foundation of any data exchange on the web.

→ URL :- (Universal Resource Locator)

It is a standardized way of addressing a particular website. It is unique to a particular website throughout the globe. (earth)

* Define Internet :- It is the largest collection of world wide networks, which are interlinked together.

---

* Programming Language :-

The Language which is an interact between system and users. There are two types of language in program;

(1) Low level Language

(2) High level Language

(1) Low level Language generally classified into two types;

⇒ Machin level Language :- The program written in this language are 0,1 i.e binary format.

Advantage :- It doesn't require an interpreter for execution. It is execute very fast.

Dis advantage :- It is machine dependent. The programmer need to have an idea about computer hardware, hence it is very difficult to write this program.

→ Assembly language :-

It is the category of program which are written by using pneumonic code. Numeric address location can be addressed by using alpha numeric variables, which helps the user to remember the location address easily.

It provides an additional instruction known as pseudo instruction for various activities. Instruction consist two parts opcode and operand.
(operation code) (address / operand)

Advantage :- • It is easier to understand.
• programs are easiere for locating errors & debugging.

(2) High Level Language :- In this language, programmer can write program in English like language. It is user friendly and provides the user with facility and instruction set.

Advantage :- It is easy to Learn. It require less time to write ~~Eas~~ easiere to maintain problems. Programs written in highlevel can be translated into many machine language, and can run on any computer.

Disadvantage :- It to be translated into machine language by a translator. The object code generated by translator might be inafficient

---

[VIRUS :- VITAL INFORMATION RESOURCES UNDER SIEGE]

Virus is a kind of malicious (Harmful) software ~~written~~ written intentionally to enter a computer or system without permission or knowledge of user.

A computer virus may corrupt or delete data on a computer. A true virus can only spread from one computer to another, through the internet, or carried it on removable medium, such as floppy disk, CD, DVD, or USB drive.

There are following some computer virus;

→ BOOT VIRUS :- It infect the boot record on the hard disk. which is responsible for loading the operating system in Memory.
Ex :- From, Disk Killer, Stone Virus, Michael Angelo, etc.
This virus also known as system virus.

→ PROGRAM VERUS :- It infect executable files like .exe, .com, .bin, .drv, .sys, .etc. These virus are loaded in memory during execution of files, along with them.
Ex :- Sunday, Cascade.

→ MACRO VIRUS :- It is a new type of computer virus that infats the Macro within a document. When we open a word processing or spread sheet document, the macro virus is activated and it infects normal documents.
Ex :- DMV, Nuclear, word concept.

→ Multipartite Virus :- It is a hybrid of boot and program virus. It first infect the program files and when the infected program is executed, these virus infect boot record.
Ex :- Invader, Flip, Tequila.

→ Polymorphic Virus :- It is capable of convent its code in different manner. These virus are difficult to defect.
Ex :- Cascade, Evil, Proud, Virus 101.

→ STEALTH VIRUS:- It use certain technique to avoid detection. They usually direct infect to disk head.
Ex:- Joshi, Whale, Frodo.

* DETECTION:- The virus is detected by some antivirus program, or other types of diagnostic program.

* PREVENTION:-
→ Don't allow outside CD/floppy or pendrive to used without proper scanning.
→ Always install and update a suitable antivirus software.
→ Don't visit websites which are not reputed.
→ Don't open unknown emails received in our mailbox.
→ Check the size of executable files at a regular interval.

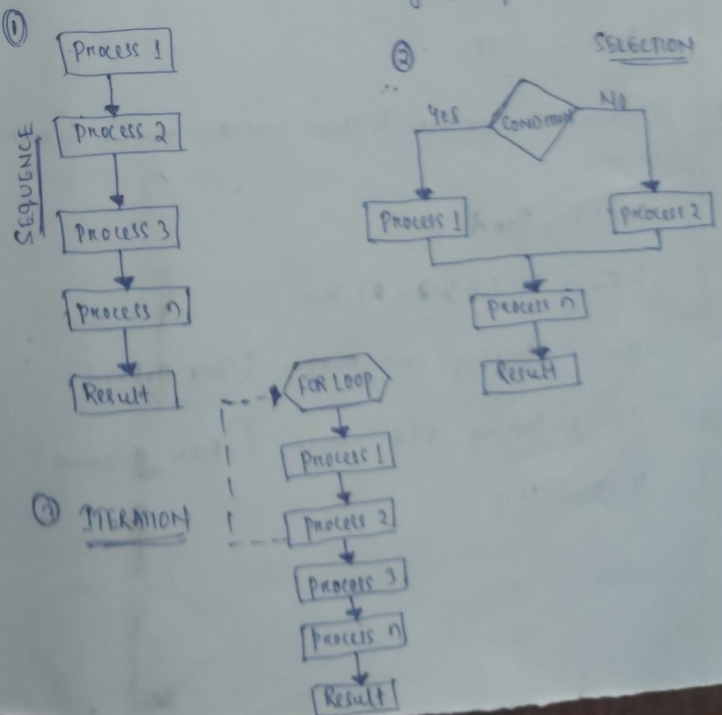
* Antivirus:- It is also software by which we can detect, prevent the virus. It is very useful program of our system.
Function:- (i) Scan, specific files or directories.
(ii) Allow ~~suitable~~ to schedule scan to automatically run.
(iii) Remove any malicious code detected.
(iv) Show us the health of our system.
Some antivirus are; Norton, Macfee, Avira, Dr.Sdomen, pc clean, NOD-32, Avast, Guardian, etc.

BOOTING:- It is the process of loading the operating system from disk into working memory.
It is initial set of operation that a computer system performs when electrical power is on.
Two types of booting:-
→ Cold Booting:- It is the process of turning on a computer after it had been power off completely.
→ Warm Booting:- It is the process of restarting a computer that already is power on.

ALGORITHM

* An algorithm can be defined as a step by step method for writing various steps of problem.
Characteristics:- (1) Algorithm should be definite
(2) It should have finite number of steps.
(3) It should mention the input required for program clearly.
(4) It should give an idea the output that will be obtained.

* Pseudocode:- It is also a step by step manner for write logic of a problem.
Both algorithm & pseudocode can be written in 3 ways;
→ sequence logic/way → selection logic/way
→ Iteration logic/way



~~Step 1 :- Read a, b, c~~

~~Step 2 :- Compare a & b~~

~~Step 3 :- If a is largest, then compare with 'c'.~~

~~Step 4 :- If b is largest, then compare with 'c'.~~

Step 5 :-

Q-1 Write an algorithm to find largest among three numbers.

Step 1 :- Start

Step 2 :- Read a, b, c

Step 3 :- Compare a, b and a, c

Step 4 :- Display a (True statement)

Step 5 :- Display b (False statement)

Step 6 :- Otherwise c (False statement)

Step 7 :- Stop

Q-2 Write an algorithm to check wheather Number is even or odd.

Step 1 :- Read A

Step 2 :- If (A % 2 = 0) then

Step 3 :- Display even number (True statement)

Step 4 :- Display odd number (False statement)

Step 5 :- Stop

⇒ FLOW CHART :-

It represent logic of a problem in a pictorial manner by using a set of predefined symbol.

Advantage :-

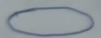
(1) It represent in a graphical manner, which is easy to create.

(2) It is also easy to modify, if logic of problem is in form of flowchart.

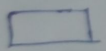
Dis advantage :- The problem solution represent in a flow chart is difficult to convert into a programs.

Symbol :-

(1) Terminator :- (start and stop)

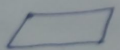


(2) process :- particular operation



(3) Decision :- branching point on condition

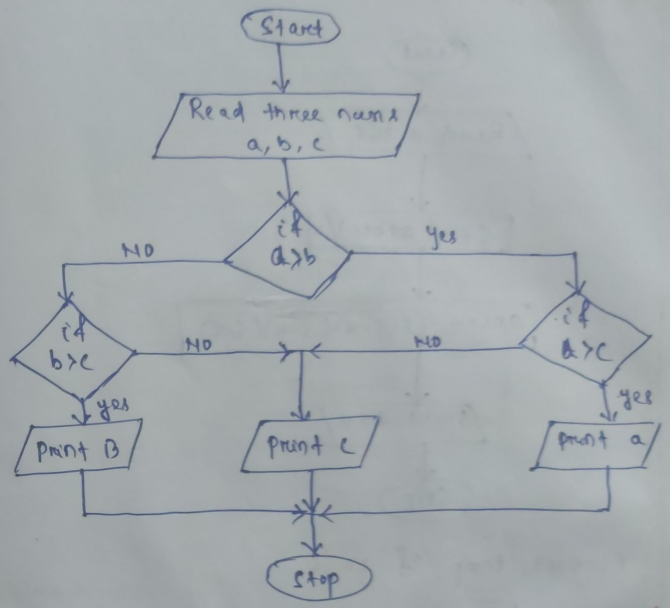
(4) Data :- entering data (input)



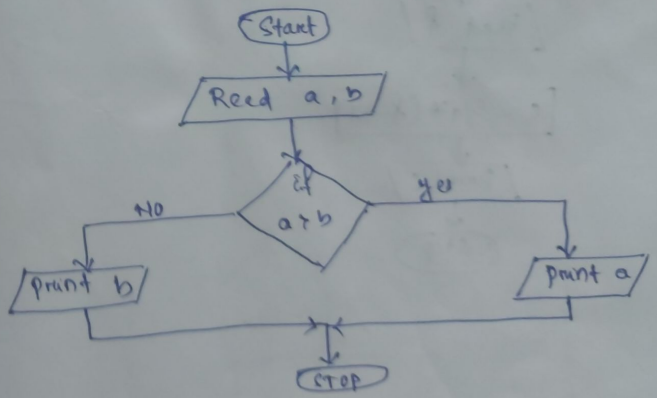
(5) On page reference :-

(6) Flow :- (data flow)

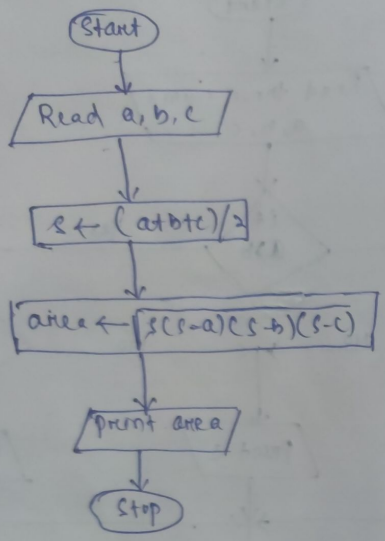
2.1. Draw a flowchart to find largest among two numbers ?



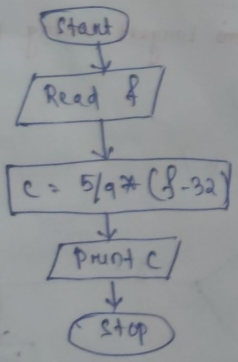
(2) Flow chart to find ~~two~~ Largest among two numbers ?



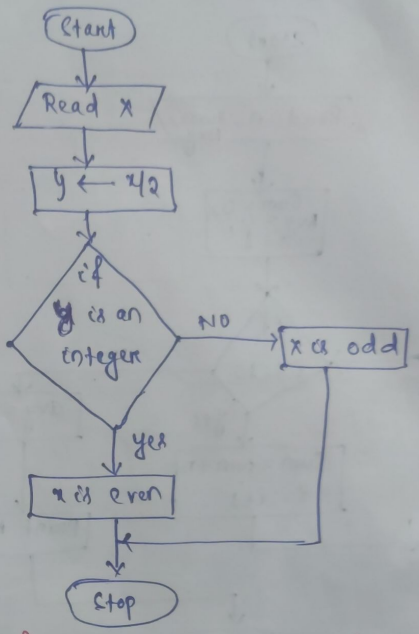
(3) Flowchart to calculate area of traingle whose side are a,b,c.



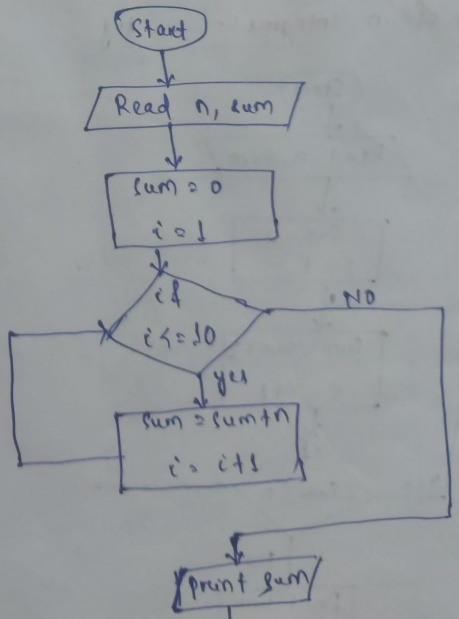
(4) Convert temp °f to °C.



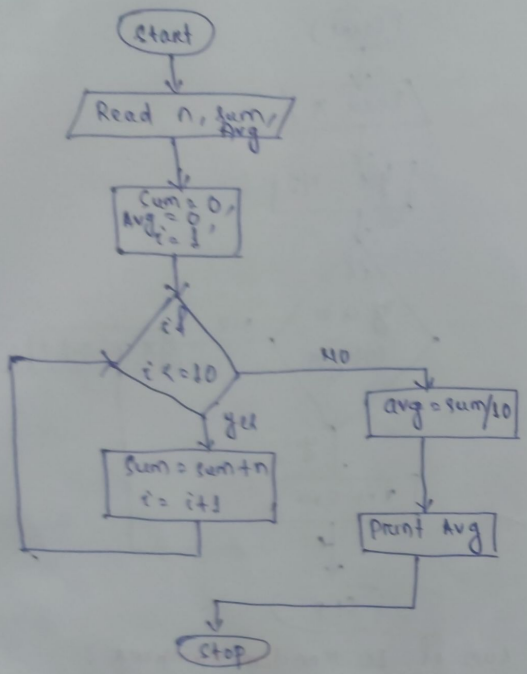
(5) To accept a number and check odd or even?



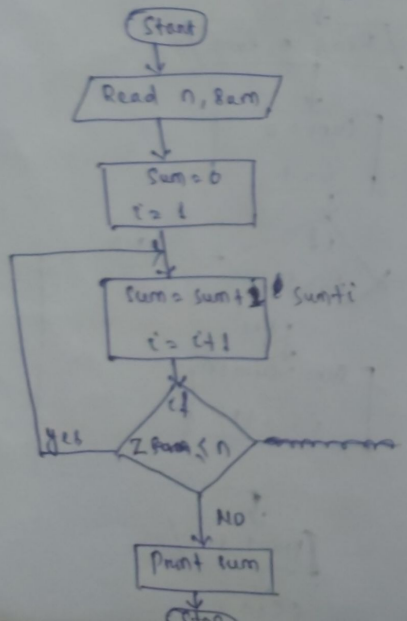
(6) Find sum of 10 random numbers?



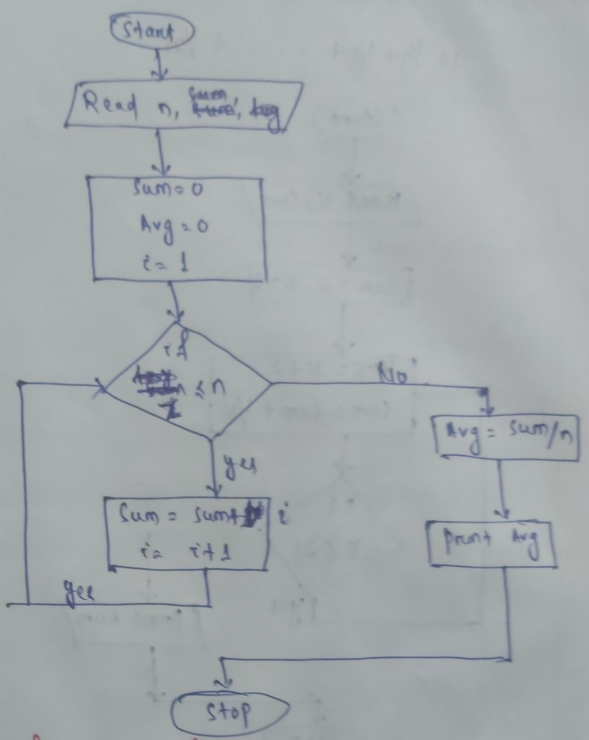
⑦ Find Average of 10 Random numbers?



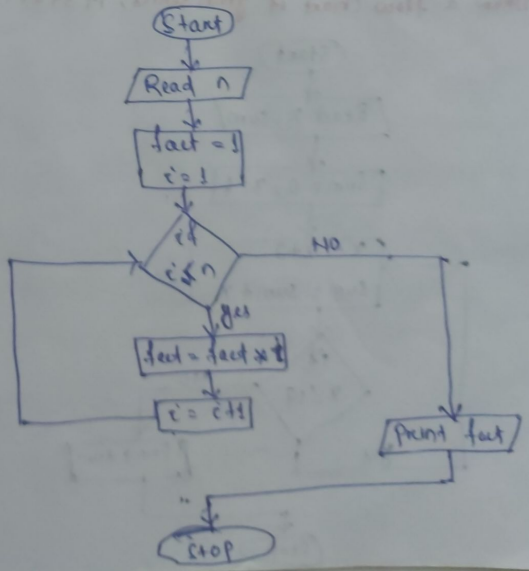
⑧ Sum of n integers:- Avg



⑨ Avg of n integers:-

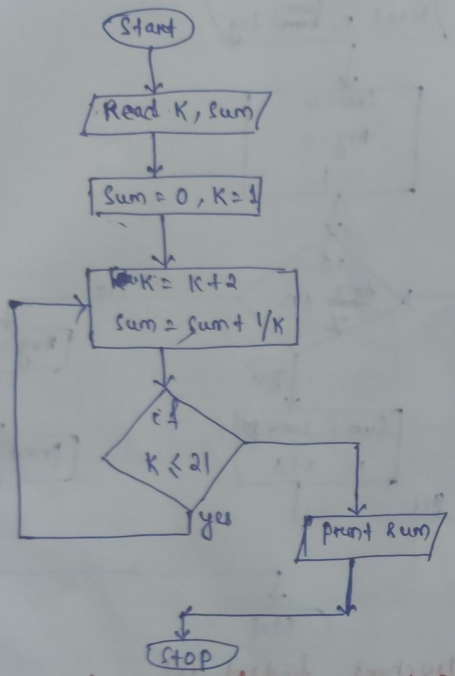


⑩ Draw a flowchart, find out n!

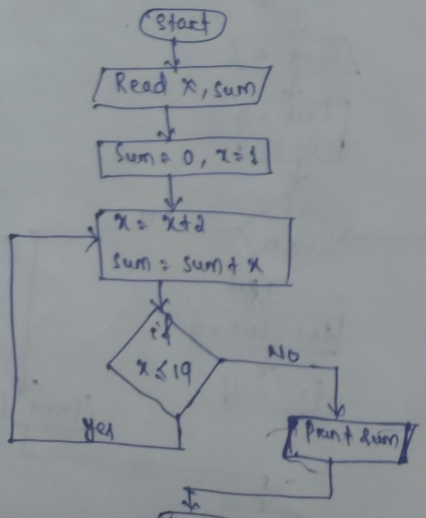


(11) Draw a flowchart of given series.

1 + 1/3 + 1/5 + - - - + 1/21



(12) Draw a flow chart of given series, 1+3+5+7+ - - +19



'C' is a programming language, develop by Dennis Ritchie in 1972, at AT and T Bell Lab.

It is also known as middle level language and mainly known as structure programming language.

As shown; → Preprocessor directives
→ Variable and function declaration
→ main function
→ Other function under Main function

Features :- (i) Every program starts execution from Main().

(ii) statements should be written in Lowercase letters.

(iii) Statements must be end with semicolon (;)

(iv) Statements with in a function should be enclosed between a pair of colybraces { }

Alphabets → A to Z, a to z and

Numbers → 0 to 9

Symbols → +, -, *, /, ^, ~, %, =, !, &, |, (), [], {}, ", ', ;, \, #, Space, _ etc. (Special character symbol)

Constant :- There are 3 types;

(i) Numeric constant :- It consist of numerical digits. If the numeric constant has decimal point, then it is called floating point. otherwise it is called integer constant.

Ex :- 25 → integer constant

7.10 → floating point constant

(ii) Character constant :- It consist of a single character within single quote. (').

ex :- 'a', 'K', '5', etc.

(iii) String constant :- It consist more characters within double quotes. (" ")

Ex:- "Box", "Rama", etc.

Variable :- whose value is changeable during execution of program. Its first letter must be alphabet.

Ex:- Mark,

a53,

mol_no. (also it consist underscore).

Keywords :- Several kinds of words are available in 'C'.

auto, break, case, char, const, continue, default, int, long, return, short, signed, sizeof, do, while, for, else, if, float, goto, enum, switch, void, etc.

Datatype :- In 'C' language it supports 4 types of datatypes;

int ⟶ 2bytes ⟶ %d

char ⟶ 1 byte ⟶ %c

float ⟶ 4 byte ⟶ %f

double ⟶ 8 byte ⟶ %lf

Declaration of a variable :-

Syntax :- <datatype> <variable name>;

```
int x;
char y;
float z;
double w;
```

Header file :- #include <stdio.h>

#include <conio.h>

Operator :- There are 6 types of operators;

→ Arithmatic operator :- +, -, *, /, %

→ Logical operator :- AND → &&

OR → ||

NOT → !

→ Relational operator :- < (less than)

> (greater than)

== (equal to / compare)

!= (not equal)

<= (less than equal)

>= (greater than equal)

→ Conditional operator :- ?

→ Assignment operator :- = (equal to)

→ Increment or Decrement operator :-

Increment → ++i and i++ (Both value are not same)

decrement → --i and i--

++i ≠ i++ and --i ≠ i--

Because, x = ++i = 1+5 = 6 = x And

But x = i++ =

⇒ x = 5

(iii) String constant :- It consist more characters within double quotes. (")

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Because, x = ++i = 1+5 = 6 = x Ans

But x = i++

⇒ x = 5

Q.1. WAP to convert temp. in farenhite to centegrade.

```
#include <stdio.h>
void main()
{
float f,c;
printf("enter temp. in farenhiet");
scanf("%f", &f);
c = 5/9 * (f-32);
printf("centigrade is = %f", c);
}
```

Q.2 Wap to findout area and perimeter of a rectangle.

```
#include <stdio.h>
void main()
{
float l,b,P,a;
printf("enter length and breadth of rectangle");
scanf("%f %f", &l, &b);
P = 2*(l+b);
a = l*b;
printf("perimeter = %f \n Area = %f", P, a);
}
```

Q.3 WAP enter two numbers, find out their sum and Avg ?

```
#include <stdio.h>
#include <conio.h>
void main()
{
clrscr();
int x,y, sum, avg;
printf("enter two numbers");
scanf("%d %d", &x, &y);
sum = x+y;
Avg = sum/2;
printf("sum is:", %d", \n);
printf("Avg is: %d", \n);
getch();
}
```

Q.4 WAP enter the value of two numbers and exchange them using third variable ?

```
#include <stdio.h>
#include <conio.h>
void main()
{
clrscr();
int a,b,x;
printf("enter two numx");
scanf("%d %d", &a, &b);
x = a;
a = b;
b = x;
printf("exchange value of a is: %d");
printf("exchang value of b is: %d");
getche);
```

~~without~~ exchange value without third

```
#include <stdio.h>
#include <conio.h>
void main()
{
clrscr();
int a,b;
printf("enter two numbers");
scanf("%d %d", &a, &b);
a = a+b-a;
b = b+a-b;
printf("exchange value of a & b is : %d %d");
getch();
}
```

QUESTIONS AND ANSWER

Q.1→ WHAT ARE THE PRINCIPAL COMPONENTS USED IN 2ND & 3RD GENERATION COMPUTER?

ANS:- Components used in 2nd generation is "Transistor", which memory capacity 100Kb and components used in 3rd generation is I.C (Integrated Circuit), which memory capacity is several Kb or 1 Mb.

Q.2→ WHAT ARE THE PRINCIPAL COMPONENTS USED IN 1ST & 4TH GENERATION COMPUTER?

ANS:- Components used in 1st generation is "Vaccume tube", & components used in 4th generation is VLSIC (Very Large Scale Integrated Circuit). It's memory capacity is several mb or 1 GB.

Q.3→ WHAT IS COMPUTER?

ANS:- A computer is an electronic device with the ability to accept input from users, process the data and output the results to users. And also ability to store the users data.

Q.4→ DEFINE CPU?

ANS:- CPU stands for central processing Unit. It is the brain of computer system. Function of CPU is to execute the programs. It contains sub units; (i) control unit (ii) ALU (Arithmatic Logic Unit)

CONTROL UNIT:- (C.U)

It generates the timing and control signals that are necessary to execute instructions. It controls entire operation of computer.

ALU (Arithmatic Logic Unit):-

In which where all arithmatic and logical operations will be performed.

Q.5→ WHAT IS DATA & INFORMATION?

DATA:- It is the collection of RAW facts and figures.

INFORMATION:- Data which have a meaningful results.

Q.6→ WHAT IS ADVANTAGE & DISADVANTAGES OF COMPUTER?

ADVANTAGE:- (i) Better job opportunity
(ii) Benifits of work at any time
(iii) Improvement of product
(iv) Better service of people.

DISADVANTAGE:- (i) LACK OF COMMONSENSE → Computer have no idea, no own Logic and commonsense. (ii) Inability to connect.
(iii) Depends up on human.
(iv) Portability

Q.7 → WHAT ARE THE FEATURES OF COMPUTER ?

Ans:- Speed:- Computer have a tremendous speed.

Volume:- The large volume of data in coverage capacity.

Less time:- Input the data and output the result is very shortly.

Accuracy:- Input data and output the result is accurate.

Storage:- Data can be store in memory.

Q.8 → DEFINE INPUT & OUTPUT DEVICE OF COMPUTER ?

INPUT DEVICE:- Keyboard, MOUSE

MICR:- (Magnetic Ink Card Reader)

It is one type used in back-up chip. It is used in which have 10 digit of special character are available. It is currently used in debit card.

OCR:- (Optical Card Reader) It also used for computers system, which can be accept data in a laser light or beam of a particular device.

OMR:- (Optical Mark Reader) It is a ~~mark~~ marking device which is used in question sheet and answer sheet. It also used in present or absent format through computer system.

LIGHTPEN:- Light sensitive band used in conjunction with a CRT TV set or monitor. It allows user to point to displayed objects or draw on screen. It can work with any CRT based display, but not LCD screens or projectors.

OUTPUT DEVICE:- MONITOR:- It is also known as VDU or visual display unit. There are CRT (Cathode Ray Tube), LCD (Liquid crystal display) and TFT (Thin Film Transistor).

Printer:- It is an output device in which we can print document or convert soft copy to hardcopy.

It can be classified into two types;

→ Impact Printer:- It is directly touch on a paper, its rotate or move right to left to write position on a printing paper.

→ Non impact printer:- This printer can be used in a laser beam, the beam can be ~~produced~~ ~~facility~~ flash out on a mirror glass then print on a paper. The laser printer can be produced facility in Xerox, Scanning, Printing, & Fax etc.

Plotter:- A plotter is a special purpose O/P device that draws image with ink pens. It requires data in a vector graphics format that can produce images with a series lines. There are two types of plotters;

Drum plotter:- This is a plotter that has a drum. Pens in a drum plotter move across the paper while the drum is turning. A drum plotter is capable of plotting on a drawing sheet and is used in most of CAD applications.

Flatbed plotter:- This is a plotter has a bed. This is also called a table plotter. The plotter draws graphics on the paper placed on the bed. This plotter is usually used for producing large drawing.

SCANNER:- (Input device)

That optically scan images, text, handwriting, or an object and convert it to a digital image.

Q.9 → CLASSIFICATION OF COMPUTERS ?

Ans:- Computers are broadly classified into following three categories;

→ ANALOG COMPUTER:- It operates on input of continuously varying electrical voltage. It measures the input rather than counting. These are powerful tools to solve differential equations. They are mainly used in scientific design and production environments.

→ Digital computer:- These are expressed as digits or numbers and computations are done with numerical digits (0 and 1). It converts other operations into addition then calculate. It is much faster than Analog computer.

→ Hybrid computer:- It is combines feature of both analog and digital computer. In this computer some calculations are done in Analog portion and some are done in digital computers.

Q.10 → DIFFERENCE BETWEEN ANALOG AND DIGITAL COMPUTER ?

ANALOG	DIGITAL
(1) It works on principle measurement of continuous changes in physical quantities.	(1) It works on the principle of counting discrete numbers know as binary numbers.
(2) Less number of equipments used.	(2) More number of components are used.
(3) Used for specific purposes like process control.	(3) Used for wide range of application
(4) Accuracy is less.	(4) Accuracy is more.