COMPUTER APPLICATION

Semester: 1ST

STUDY MATERIAL

COMPUTER APPLICATION

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COMPUTER APPLICATION

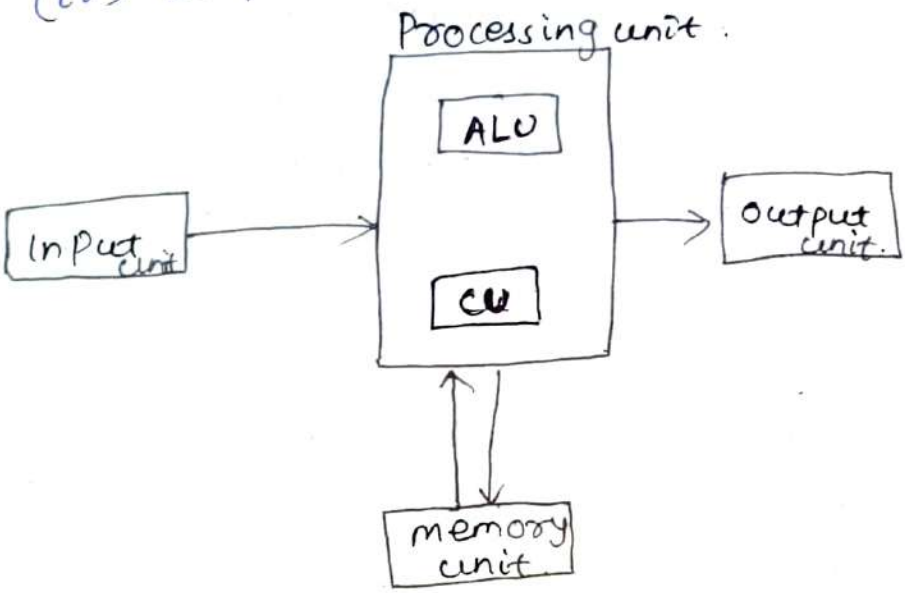
COMPUTER ORGANISATION :-

1- Defination of computer ?

Ans- computer is an electronics device which takes input data from the user, process the input data and gives result as output.

⇒ Fundamental components of computer are

(i) Input unit.
(ii) Processing unit
(iii) memory unit.
(iv) output unit.



Input unit :-

⇒ Through input unit computer takes input data from the user.

⇒ In input unit we use various input devices like Keyboard, mouse, Joystick, scanner, Barcode reader etc.

Processing unit :-

⇒ It is also known as CPU i.e central processing unit.

⇒ It is also known as the heart of the computer system.

→ It consist of 2 units i.e (i) ALU (Arithematic and Logic unit).
(ii) CU (control unit)

→ ALU is responsible for perferming of all the arithematic and logical operation. The control unit controls all the operation inside the computer system.

Memory unit :-

→ It is also called as brain of the computer system.
→ After processing of data it may be stored in mamory unit for future reference.
→ Generally memory is classified into 2 catagories.
(i) primary memory.
(ii) secondary memory.

Output unit :-

→ This unit is resposible for displaying the result only.
→ We use some output device like printer, moniter, speaker etc.

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Computer :-

→ A computer canbe defined as an electronic device that is deigned to accept data, perform the required mathmetical and logical and gives output as the result.

i.e. ~~designed~~ designed for perform mathematica and logical

characteristics of computer :-

(1) - speed
(2) - Accuracy
(3) - Automation
(4) - deligence
(5) - versatile
(6) - memory
(7) - Artificial intelligence.
(8) - Economical.

(1) Speed :-
→ computer can performs millions of operations per second. hence speed of computer is very fast.

(2) Accuracy :-
⇒ computer always gives accurate results and provided connect data and set of instructio to it.
→ In computer terminology accuracy maybe defined as garbage in garbage out (GIGO).

(3) Automation :-
→ computers are automatable devices that can perform a task without any user intere~~s~~vati

(4) deligence :-
⇒ computers never get tiend of a repetative task.

(5) Versatile :-

→ computers are versatile devices as they can Perform multiple task of different nature at the same time.

(6) memory :-

→ similar to human computer also have memory. The computer store a large amount of data and Programme in the secondary page of storage.

(7) Artificial intelligence (AI) :-

→ computer becomes intelligent due to the induction of artificial intelligence.

(8) Economical :-

→ Today computers are consider as short term investment for achevings long term gain. It also reduces man power requirements and perform various task efficiently.

Evolution of computers :-

* (1) 300 BC :- The Abacus was an early aid for mathematical computation and was designed for Performing calculations. A skilled Abacus operator can add and substracte with the same speed as that a person & performing the same calculation using a hand calculator.

(2) 1822 :- English mathematician charles Babbge designed a calculating machine that could

computes table numbers.

(3) 1936 :-

→ British mathematician Alan Turing designed a universal machine that can compute anything i.e computable.

(4) 1941 - 1944 :-

→ In this period the ENIAC (Electronic numerical integrator and calculator) was developed which leads to development of digital computer.

(5) 1946 :-

→ In this period of time a special commercial computer was developed i.e UNIVAC (universal automatic computer).

(6) 1964 :-

→ In this period GUI (Graphical user interface) was developed.

(7) 1969 :-

→ C programming was developed at Bell Labs by Dennis Ritche.

(8) 1975 :-

→ Bill - Gets started writting software using new basic language.

(9) - 1981 :-

→ The first IBM ~~Pensio~~ Pensonal computer that use MS-DOS .

(10) - 1983 :-

→ The first Laptop was introduced .

(11) - 1994 :-

→ PC. games became ~~Poplular~~ popular .

(12) - 1999 :-

→ Wifi was introduced .

(13) - 2005 :-

→ Youtube was launched .

(14) - 2009 :-

→ Microsoft launched window 7 operating System .

(15) - 2015 :-

→ Microsoft launched window 10 operating system .

→ Now-a-days computers become very popular due to the invension of AI (Artificial intelligence).

Generation of computers:- (Long question)

→ computer can be classified as

(1) First generation of computer
(2) second genration of computer.
(3) Third generation of computer.
(4) Fourth generation of computer.
(5) Fiveth generation of computer.

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(1) First generation of computers: (1942-1955).

→ First generation of computers were manufacture using thousands of vaccum tubes.
→ Electromagnetic relay was used as primary memory and punched cards were used to store data and instruction.
→ Programming was done in machine or assembly language.
→ It is very costly.
→ It is difficult to use.
→ It emits a large amount of heat frequently.
→ Required air conditions rooms for instalation.
→ It always required constant maintainance.
→ computer were too bulky and required a complete for storage.

ex:- ENIAC, EDVAC etc.

(2) second generation of computers:- (1955-1964)

→ Second generation computers were manifacture in transistors.
→ Magnetic core memory was used as primary memory.

⇒ Programming has done in a high level programming language.

→ It is used for Scientific and ~~commercial~~ commercial application.

→ It is Easier to use than the first generation computers.

→ It required a less storage page for its installation.

→ It emits less heat than the first generation computers.

→ It is very costly.

→ ~~Difficult~~ Difficult to use.

ex:- UNIVAC, IBM7030 etc.

(3) Third generation of computers :- (1964-1975):-

→ Third generation computers were manufacture using integrated ~~ci~~ circuit (IC).

→ Larger magnetic core memory was used as primary memory.

→ Programming was done in high level programming language.

→ These are used for Scientific, commercial and interactive online application.

→ Easier to use than the second generation of computer.

→ It emits a less heat than the second generation computers.

→ Easier to use and upgrade.

Ex:- IBM-360, PDP8 etc.

(4) Fourth generation of computers:-(1975-1989).

→ Fourth generation computers were manufacture using microprocessor.

→ Semiconductor memory was used as primary memory.

→ Programming was done in high level language.

→ These are used for scientific, commercial, interactive online and network applications.

→ Easier to use.

→ powerful and relayable than other generation of computers.

Ex:- IBM PC.
APPle II.

(5) Fifth generation of computers:-(1989-at present)

→ Fifth generation computers were manufacture in artificial intelligence.

→ Semiconductor memory is used as primary memory.

→ Programming is done in high level programming language.

→ used for scientific, commercial, interactive online, multimedia and network application.

→ They consume less power than computers of previous generation.

→ Air condⁿ rooms required for super computer but not for microprocessor.

Ex:- Pentium PC , IBM Note books etc.

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Classification of computer :-

→ All the modern computers are broadly classified following 3 catagories :-

(1) Analogs computer.
(2) Digital computer.
(3) Hybrid computer.

(1) Analogs computer :-

→ These are mostly used in industries in process control activities.
→ These computers work on Analog data such as variation in temp, pressure, speed, voltage etc.
→ They are not general ponpose computers rather they are specific to a particular appn area.
→ The uses of such computers are very limitted.

(2) Digital computer :-

→ These are general ponpose registers.
→ The speed and accuracy with these computers work are very high.
→ Digital computers can be classified into
(1) Super computer
(2) Main frames.
(3) Mini computers.
(4) Personal computers.

(1) Super computers:-

→ Super computers are the most powerful computer.

→ This is possible because of parallel processing technique which impliments multiple processers to work in parallel manner.

→ This computer used their own operating system and programming language and varies from computer to computer.

→ Such computers are ~~very~~ very expensive.

(2) Main frames computers:-

→ After super computers main frame computer can also process milions of instruction ~~of process~~ per second.

→ Large primary memory.

→ Ability to connect thousands of terminals.

→ This is normally too expensive.

→ Ability to handle a large computer application.

(3) mini computers :-

→ These computers gives less perbormance and work as compare to main frame computers.

→ It has primary memory.

→ Can connect upto 500 terminals.

→ These are generally used in the field of Engg. and scientific organisation, educational Institutes, Univercities.

(4) personal computers:-

→ The smallest and least expensive computers are Pensional computers or micro computers and populanly known as PC.

→ These computers are portable.
→ They require minimum power.
→ memory capacity is sufficient to handle most of the task.
→ Easy to use and supports various types of operating system and application software - software.

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Classification of computer memory :-

The storage unit of the computer holds data and instructions that are entered through the input unit before they are processed.
→ It also saves the data for the later use.
→ computer memory can be classified into different catagories :-

(1) Register memory.
(2) Cache memory.
(3) primary memory or main memory.
(4) Auxiliary or secondary memory.

(1) Register memory :-

→ It is integrated inside the CPU.
→ It consist of a number of flip-flop or register arranged in shorter manner.
→ This is a small capacity memory used for storing data or instruction temporarily during the execution of an instruction.

⇒ This is the fastest memory available in a computer.

Ex:- PC (Programme counter), MAR (memory adress Register)

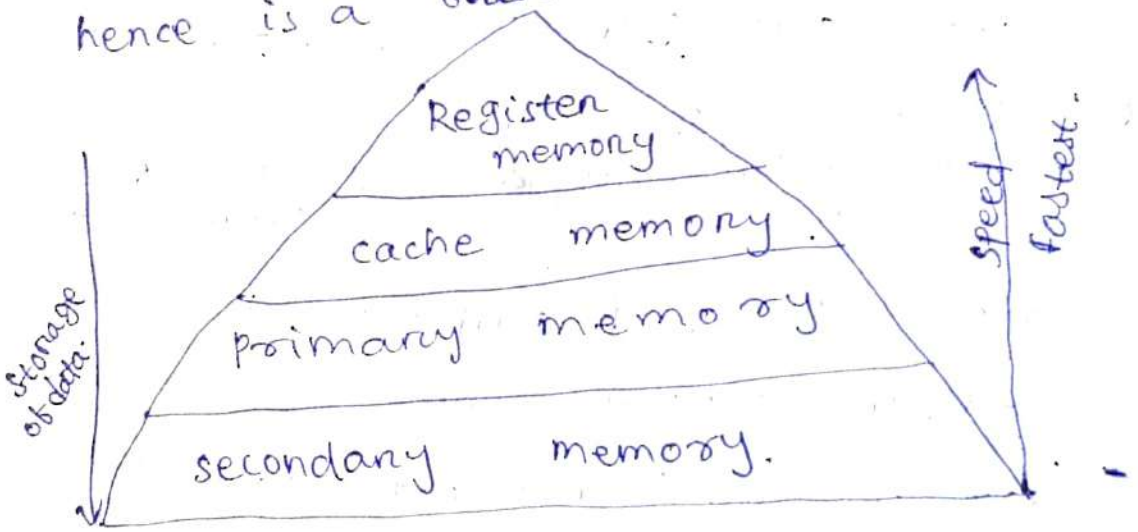
MDR (memory Data register).

(2) cache memory:-

⇒ This memory is a small memory situated betn the CPU and Main memory.

⇒ The purpose of this memory is to hold or store frequently needed instruction or data from the main memory location during the execution process.

⇒ This is a semiconductor memory which is having very low Access time and hence is a fast memory.



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Primary memory :-

→ It is also known as main memory or internal memory and can be directly accessed by the CPU.

→ primary memory is again classified in 2 catagories :- (1) RAM (Random Access memory).
(2) ROM (Read only memory).

RAM :-

→ It is avolatile storage area with in the computer

→ The information stored in the ram is basic loaded from the computer hardisk and include data related to the operating system. when the RAM gets full the computer system operates at a slow speed.

→ It is again classified into 2 categories :- (1) static RAM
(2) Dynamic RAM.

ROM :-

→ It is called as Read only memory.

→ It refers to computer memory chips containing Permanent or semipermanent data. It is a non-volatile memory i.e the data is present even after the computer is turned off.

→ It is again classified into PROM (Programmable read only memory).

EPROM - (Erasable Programmable read only memory).

EEPROM / E^2PROM - (Electrically erasable programmable read only memory).

EAPROM - (Electrically Aterable programmable read only memory).

UV PROM - (Ultra violet programmable read only memory).

→ Usually in order to update the programmes stored in ~~them~~ ROM, the ROM chip ~~hard~~ hard to be removed and physically replaced by another that have a newer version of the programme.

Difference beth RAM and ROM :-

RAM	ROM
(i) Its stands for Random access memory.	(i) Its stands for Read only memory.
(ii) It is a Read write memory.	(ii) It is a Read only memory
(iii) It is a volatile memory.	(iii) It is a non-volatile memory.
(iv) cost is very high.	(iv) It is companatively ~~chep~~ cheaper than RAM.
(v) Data in RAM can be modified.	(v) Data in ROM can not be modified.

Secondary memory :-

→ It is also known as external memory or auxillary memory.

→ It is not directly accessible by the CPU.

→ The secondary stonage devices hold data whe the computer is switch off or turn off.

→ Secondary stonage devices are non-volatile in nature, chiper than the primary memory, and can be used to stone huge amounts of data.

Ex:- Handisk, magnetic tapes, Flopidisk, CD/DVD, external handisk, pendrive, memory cards.

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computer software:-

→ A computer system mainly classified into two categonies.

(1) computer handwane

(2) computer software.

The computer handwane refers to all the physical components presents in a computer which we can touch. (Tamgible components).

→ The computer software refers to the set of programe which m. the handwane operations

→ A programme is a set of instructions that is arranged in a sequence to guide a computer to find a solution for a given problem.

→ The process of writting a programme is called programing.

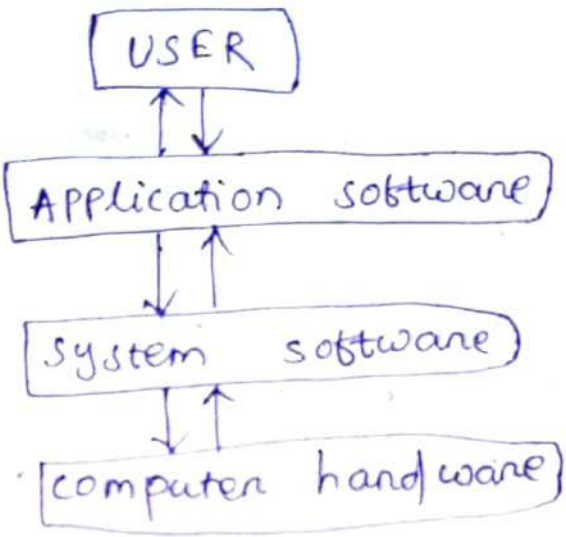
→ computer software is written by programmer using a programming language.

Classification of computer software:-

→ computer software can be broadly classified into two categories.

(1) system software.

(2) Application software.



System software:-

→ A set of software programs which are designed to control the operation of computer hardware and support it for errors free computation - is known as a system software. It performs the following activities.

(i) It provide a platform for installation and development of application software.

(ii) It monitors the effective utilization of the various hardware resources.

(iii) It provides a error free communication between the main computer system and the attached peripheral devices.

(iv) It facilities the execution of a program written in high level language.

Some common systems software are.

(1) operating system (OS)

(2) Language processor.

(3) Device Drivers

(4) utility programs.

Application software :-

→ Application soft is a type of a computer software that provides the capabilities of a computer directly to perform a user defined task.

→ There are two classes of application software.

(1) High level language.

(2) Application package.

Difference beth system and application software.

System software	Application software
(1) Its a collection of programs which use to interact to with hardware components efficiently.	(1) Its a collection of programs written for a specific application.
(2) It controls and manage the hardware.	Ex :- Library management system, Tourism information system etc.

	(2) It uses the services provided by system software to interact with hardware components.
(3) It is machine dependent.	(3) It is machine independent.
(4) The programmer must be understand the architecture of the machine and hardware details to write system software.	(4) Generally the programmer ignores the architecture of the machine and hardware details to write application software.
(5) Writting system software is a complicated task.	(5) Writting application Programmer an is relatively easy.

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Operating system :-

- It is a system software which act as an interface between computer system and human user.
- It is read as OS (operating system).
- It manages all the other programs in a computer.
- Users can interact directly with the operating system through a user interface such as a command language or a graphical user interface.

Functions of operating system :-

→ The operating system task can be divided into following catagories

(i) Resource management.
(ii) process management.
(iii) memory management.
(iv) Device management.
(v) Information management.

(i) Resource management :-

→ As a resource manager operating system keeps a track of all available resources of the computer.

→ Resources can be allocated to the various requesting Jobs using some penticular rule.

→ It also deallocate the resources from the requesting Jobs.

(ii) Processor management :-

→ operating system is responsible for managing allocation of the processor between the different programs using a scheduling algorithm.

→ The job of the operating system is to keep track of all the active processes and availab processor slot.

⇒ Basing on shorten policy.
⇒ Most of the operating system perform
(i) create process.
(ii) Terminent a process.
(iii) Block a process.
(iv) suspend a process
(v) Delay a process etc.

(iii) Memory management:-
⇒ It keeps a track of the available memory, allocating the memory to different active processes basing on shorten priority policy.
⇒ And finally taking bake the memory from the processes when they are complete.

(iv) Device management:-
⇒ It keeps track of the input output devices connected to the computer.
⇒ The method of assigning the input output devices to processes is known as spooning.

Information management:-
The following activities are related to information management.
(i) creation of file and directory.
(ii) open or closing a file.
(iii) Read or write data from or to file
(iv) maintained file status etc.

Objectives of operating system:-

→ It acts as an interface betn computer hardware and user.

→ It provides a commands interpritor which is either in the form of text or icons to the user.

→ It provides some data management facility to the user to organize the data stored in the computer.

→ It provides programming developement tools which helps the user to write and execute programs.

→ Every operating system has got some security features for authentic use of system resources.

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Types of operating system :-

→ All the operating system can be broadly classified into 4 chatagories :-

(1) Single user single task.
(2) Single user multitasking.
(3) multi user
(4) Real time operating system.

Single user single task :-

This operating system is designed to manage the computer so that one user can do one work at a time.

Ex:- hand helding system device, dos.

(2) Single user multi tasking :-

→ This operating system is degin designed to manage the computer, so that single user can i several programs at the same time.

Ex:- microsoft windows.

(3) Multi user :-

→ A multi user operating system allows many different users to take advantage of the computers resources simultaneously.

(4) Real time operating system :-

→ Real time operating system are use to control mechinery, scientific instrument and industrial systems.

Again operating system can be classified as -

(1) Batch processing system.
(2) multi programming system.
(3) Time sharing system.
(4) Multi processing system.
(5) Real time operating system.
(6) multi tasking system.
(7) Network operating system.

Batch processing system :- This operating syste supports processing of the jobs one at a time The jobs are submitted in a batch.

Ex:- Printing.

(2) multi-programming system :-

→ multi-programming is a technique use to utilize maximum cpu time by running multiple programs simultaneously.

(3) Time shaning system :-

→ The time shaning operating system is a multi-processing system which supports multiple users to work as multiple terminals. This operating system makes time slice of the CPU time and distribute among the multiple users sitting at various terminals.

(4) multi-processing system :-

→ multi-processing system work with two or more CPU within a single computer system.

(5) Real time operating system :-

→ It is a multi-tasking operating system which are used for real time applications in which the total connectness of an operation depends not only its logical connectness but also the time in which it is perform.

(6) Net work operating system (NOS) :-

→ It is a software that includes special functions for connecting computer and devices into a local area network.

Ex :- uniques, windows networking operating system

Difference between operating sys windows and DOS :-

Windows	DOS
(1) It is a graphics user interface (GUI).	(1) It is character user interface (CUI).
(2) It is a multi user multi tasking operating system.	(2) It is a single user operating system.
(3) It provides inbuilt commands in various applications which can be used on a mouse click.	(3) All the commands have to be tight at the DOS prompt to do some particular work.
(4) It supports graphics.	(4) It doesn't supports graphi
(5) It provides a multitasking environment.	(5) It doesn't provide a multi tasking environment

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Programming language:

⇒ computer is a digital device which can only understand binary data.

⇒ We use different kind of programming language for writting a computer program.

⇒ It can be classified into the following catagories:

(1)- machine level language.

(2)- Assembly language.

(3)- High level language.

etc.

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(1) Machine level Language :-

→ This is also known as lower level language.

→ The programs written in this language are in 0, 1.

→ For writting a program in this language one need to have a detail knowledge of the internal hardware Architecture of the computer.

Advantages:-

→ It doesnot require an interpreter for execution.

→ It is exicuted very fast.

Disadvantages :-

→ It is machine dependent.

→ The programmer need to have an idea about the computer handware, hence it is very dibficult to write this program.

(2) Assembly Level Language :-

→ These programs can be written by using some pneumonic codes.

→ A program writting in assembly language goes through a system program known as assembl which interprints or convert the Premonic codes in to machine level language.

Advantages:-

→ Assembly language program is easier to underst

→ These programs are easier for locating erro

and debugging.

Disadvantages :-

- It is also machine dependent.
- A hardware Architecture knowledge is required to write assembly language program.

(3) High level language (HLL) :-

- It is a programming language where a programer can write program in english like language.
- A translator is required for converting high level language to machine level language.
- Generally we use compiler or interpretor.

Advantages :-

- It is machine independend.
- It is easier to learn and use.
- It Generally gives very minimum number of error.
- The program written in HLL is easy to modified and maintain.

compiler	interpretor
(1) compiler scans the entire program and translates the whole of it into machine code.	(1) interpretor translate Just one statements of the program at a time into machine code.
(2) A compiler takes a lot of time to analize the source code.	(2) An interpretor takes very less time to analize the source code.

(3) The overal time taken exicute the process is much basten.	(3) The overal time to exicute process is slowen.
(4) It requires more memory.	(4) It requires less memory.
(5) It always generates an intermediated code.	(5) It doesnot generate an intermediate code
(6) compiler generates the error message only after scans the complete program.	(6) It gives translating the program continay till the first errors occured. If any error is occured it stops working and hence error connection becomes easy.
(7) Ex:- C, C++ etc.	(7) Ex:- Python, BASIC.

Dt. 8.12.21

computer virus:-

→ computer virus is a kind of malicious software written intentionally to enter a computer without the users permission or knowledge, with an ability to replicate it self and hence continuing to spread.

→ A computer virus may courrupt or delete data on a computer.

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Dt. 8.12.21

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→ A computer virus may courrupt or delete data on a computer.

Ex:- nuclear, word concept etc.

Macro- A portion of document.

(4) Multi partile virus:-

→ It is a hybrid of Boot and Program virus.

→ They first infect the program files and when the infected program is executed these virus infect the Boot record.

Ex:- FLIP.

(5) Polymorphic virus:-

→ It is capable of encrypting its code in different manner, so that each appears different each infection. This virus are difficult to detect.

Ex:- Cascade, VIRUS-101.

(6) Stealth virus:-

→ They usually direct the disk head to read a wrong sector in the directory listing.

Ex:- FRODO.

Detection of computer virus:-

→ Any computer may be infected with a virus if it has one or more of the following symptoms.

(1) computer is giving problem during the booting.

(2) computer is reseting or restarting automatically.

(3) computer is hanging when the user tries to execute a particular program.

(4) computer is displaying some unusual figures or signs on the screen.

(5) The computer is giving some message such as insufficient memory or disk full.

(6) computer is performing some operations automatically without the users commands.

prevention of computer virus :-

(1) Do not allow outside cd or dvd / CD or DVD or pendrive without proper scanning.

(2) Do not visit website which are non reputed.

(3) Always protect your computer from unauthorized by setting a password.

(4) Donot open unknown email recived in your mail box.

(5) Protect the system by setting some antivirus software and fire wall.

Ex:- AVG, NORTON, PC-cleen, e trust etc.

Application of computer in different domains:- Dt: 10.

→ The main application of computer systems are

(1) Business :- Businessman make bargraphs and Pie charts to represent sales, Profits, cost etc.

→ It also helps in providing accurate financial detail and theire coresponding account.

(2) Buildings :- The computers provide architects some amount of facilities to create different buildings with greater accuracy, better designing and editing tools. ~~and work done at the fastest speed possible~~.

(3) Education :- Due to the change of technology and technology used in computers new teaching methods have been introduced. This enhances the knowledge of the student at a much faster than the old traditional methods.

(4) Retailing :- Due to computer a detailed recived a product can be made which is useful for both the customer and the retail store for this ~~stop~~ stuck control system.

(5) Energy :- Energy company use computers to locate oil, coal, natural gas and uranium with the use of technological machines these companies can find the site of a natural resource, its concentration etc.

(6) Transportation :- computers are used in cars to monitor fluid levels, temperature and electrical systems. It can also be used in air controlled traffic system.

(7) money :- Computers have helped to cashless economy, more use of credit cards, debit cards etc. There is also a greater security when computers are involved in money transaction system.

(8) Agriculture :- Farmers used small computer to help with dealing, crop information and cost for 1 unit market price checks etc

(9) Home :- computer used at home as a learning system. personal computers are being used for preparing budgets, produce presentations, draw pictures etc

(10) Health and medicine :- computers are now able to manage patients, doctors, nurses medicine records as well as deal with making appointments, Scheduling surgeries etc

(11) manufacturing industries :- computers are used to control the production of resources very precisely. All Robots and machinary are now controlled by various computers, making the productions process faster and the cheaper.

(12) Scientific research :- This is very important for mankind and with the development of computers. Because of high speed characteristics of computer system allow scientist to proof their theories in a cost effective manner.

(13) Training :- Railway Engineers can given some kind of training on how to run a train with the help of a computerized system. Training simulations are relatively cheaper and are always available on one to one basis for personal training.

There are so many applications of computer that it is impractical to mention all of them. Hence computers all around us and avoiding them is virtually impossible.

~~Dt 13-12-21~~

Computer network and Internet :-

very important
development of
speed characteristics
scientist to
cost effective

ineers can
on how to
a computerised
relatively
ilable on
training.

of computer
all of them.
as and
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COMPUTER NETWORK AND INTERNET

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computer network:

→ A computer network is also known as a network.
→ A computer network is a ~~collect~~ collection of computer and other devices connected in some ways so as to be able to exchange data.
→ Networks are built with a combination of computer hardware and software that supports data communications ~~acr~~ across these devices.

Advantages of computer network:

(1) File sharing
(2) resource sharing.
(3) Increased storage capacity.
(4) Increased cost efficiency.
(5) Load sharing.

Data communication:

→ For better data communication the following components are needed:

(1) sender.
(2) Receiver.
(3) message.
(4) Data transmission medium.
(5) protocol:- A protocol is a set of rules that governs the data communication. These rules include Guidelines that regulate types of cabling, speed of

data transfer, types of topology.

Different types of networking protocols

(1) HTTP - Hyper Text Transfer Protocol

(2) FTP - File transfer protocol.

(3) ARP - Adress Resolution protocol.

(4) UDP - User Datagram protocol.

(5) TCP - Transfer Control protocol.

(6) IP - Internetworking protocol.

(7) SMTP - simple mail Transfer protocol.

(8) SNTP - simple Networking Transfer protocol.

Data Transmission modes

The way in which data is transmitted from one place to another is called data trasmission mode. It is also known as data communication mode or directional modes.

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Dt. 17.12.21

The transmission of data can be directerised by the following features :-

(1) dirn of data flow

(2) No. of bits sent simultaneously.

(3) Sinchronization betn the sending and receiving divices.

It can be classified into three chatagories:-

(1) simplex mode.

(2) Half duplex mode.

(3) Full duplex mode or duplex mode.

simplex mode:-

→ In simplex mode data can flow in only one dirn.

→ In this mode a senden can only send data and can't receive it.

→ In simplex mode it is not possible to confirm successful transmission of data.

Ex:- data send from computer to printer, Radio and TV transmissions.

Half-duplex mode:-

→ In half duplex mode data can flow in both dirn but only in one dirn at a time.

→ In this mode data is send and receive alternatively.

→ Ex:- Internet browsing.

Full duplex mode / duplex mode:-

→ In full duplex mode data can be flow in both dirn at the same time.

→ His the fastest directional mode of ~~data~~ data transmission.

→ In the real world the full duplex transmission is widely used.

Ex:- Two way traffic system, Telephone communication system.

Serial and parallel transmission :-

Serial transmission :-

→ In a serial connection the data is send one bit at a time over the transmission channel.

→ In serial data transmission bits of data are transmitted sequencially.

→ serial transmission is slow slower than parallel transmission.

Parallel transmission :-

→ In a parallel connection n bits are simultaneously transmitted over the communication channels.

→ It is fasten than serial transmission.

Network TOPOLOGY :-

→ The graphical or pictorial representation of a computer network is called network TOPOLOGY.

→ Hence network topology refers to the actual geometric lay out of the computers and other devices connected to the network.

→ There are different types of network topologies

(1) BUS TOPOLOGY.
(2) STAR TOPOLOGY.
(3) RING TOPOLOGY.
(4) MESH TOPOLOGY.
(5) TREE TOPOLOGY.
(6) HYBRID TOPOLOGY.

(1) BUS TOPOLOGY :-

→ In a Bus topology each computer or server is connected to a single cable.
→ Hence all the nodes share the same communication channel.
→ A device wanting to communicate with another device on the network sends a message onto the wire that all other devices see but only the receiver actually accept and process the message.

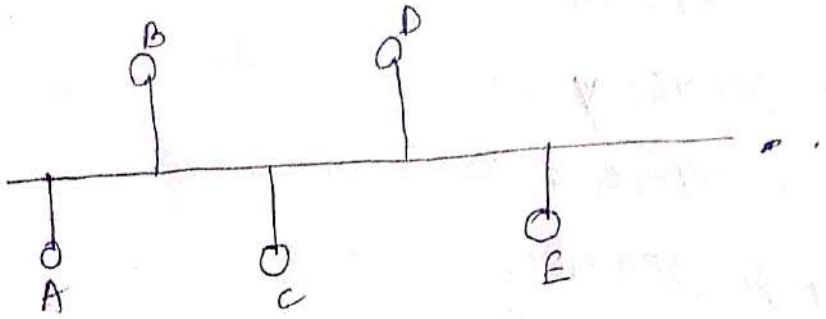
Advantages :-

→ Easy to install.
→ A new device can be add to the network.
→ Requires less cable length.
→ cost is low.
→ Falicur of a single node doesn't affect the network.

Disadvantages :-

→ Falicur in the cable results in shutdown of the entire network.
→ It becomes very difficult to identify the problems.

→ As the number of nodes increases the speed of the network slows down.



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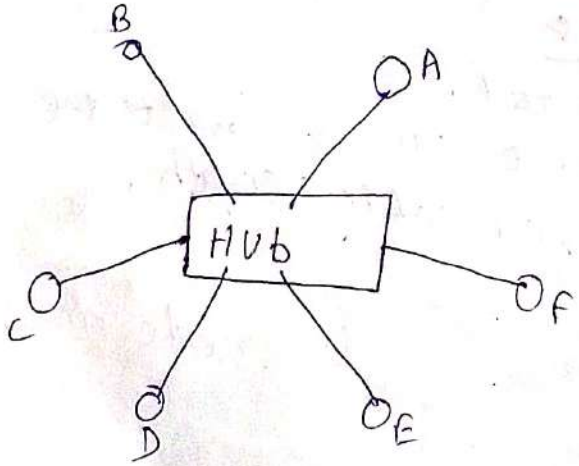
STAR TOPOLOGY:-

→ In this topology each node is connected to a central hub with a point to point connection.

→ All traffic that transmits the network passes through the central hub.

→ When a node has to send a message to another node connected to the network. it will fast have to send that message to the hub. The hub will regenerate the message and then send it to the destination.



Advantages of star topology:

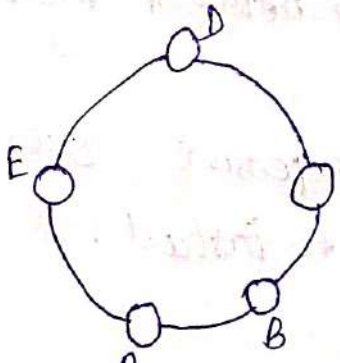
→ Ealy to install.
→ New nodes can be connected easily.
→ Networks doesnot get disturbed when a device is added or removed from it.
→ Easy to detect defect faults.
→ failure of any other node doesnot affect the network.

Disadvantages:-

→ Requires more cable than bus TOPOLOGY.
→ If the central hub fails the entire network is shutdown.
→ More expensive than bus topology.

RING TOPOLOGY:-

→ In a ring topology every device or node has exactly two adjucent nodes for data-communication.
→ All the nodes are connected to each other in the shape of a closed loop.
→ A failure in any cable or device breaks the loop and can shutdown the network.
→ In a ring topology each device acts as a repeater to keep the signal strong.



Advantages :-

→ Easy to install.
→ It can used over largen distances.
→ Every nodes has equal chance to transmit data.

Disadvantages :-

→ It one node fails the entire network is shutdown because the ring is not complete.
→ Difficult to add or remove nodes from the network.

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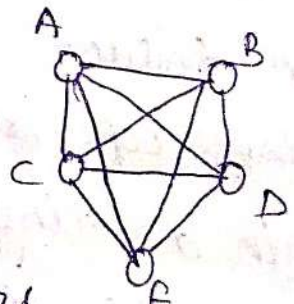
MESH TOPOLOGY :-

→ It is also known as a completely in connected network.
→ In this topology every node is connected to every other node on the network using a separate physical link.

Advantages :-

→ Failure of a node doesnot affect the entire network.
→ communication is fast as their is a direct link between the nodes.
→ Traffic problem is eliminated.
→ It ensures security of data.
→ It is easy to detect network errors.



Disadvantages :-

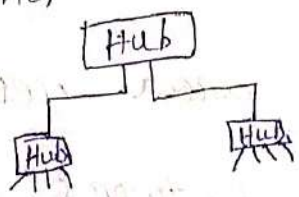
→ It is the most expensive network.
→ It is difficultlt to install.

TREE TOPOLOGY :-

→ Tree topology integrate multiple star topology together onto a bus.

→ In tree topology only hub devices connected directly to the tree bus and each functions as the root of a tree of the devices.

→ A tree topology combine characteristics of linear bus and star topologies.



HYBRID TOPOLOGY :-

→ Hybrid network topology uses a combination of two or more topologies in such a way that the resulting network does not exhibit one of the standard topologies.

Types of network :-

→ Networks can be classified on the size of node, there data transfer speed and their occurance.

1- LAN (Local area network).
2- MAN (metropolitan area network).
3- WAN (wide area network).
4- PAN (Personal area network).

LAN (Local area network) :-

→ LAN was first invented for communication between two computers.

→ Later with the growth in technology it

was used to connected computer and devices in homes, schools, computer laboratory, office building etc.

→ LANs are typically owned, controlled, managed by a single person or organisation.

→ LANs are the preferred because they have higher data transfer rates, smaller range etc.

MAN (metropolitan area network):-

→ A MAN is a network that interconnects computers and other devices in a region larger than that covered by LAN.

→ A MAN may interconnect networks in a city, a campus or a ~~community~~ communities to form a single larger network.

WAN (wide area network):-

→ A WAN connects multiple LANs to one another over a great geographic distances.

→ The internet is the largest ~~one~~ WAN.

→ The internet is a public WAN ~~one~~ but organisations can also form private one which are basically two or more LAN connected to each other.

PAN (Personal area network) :-

→ A PAN is a computer network designed for communication betn computer devices such as mobile computers & cellphones that are close to one person.

→ The scope of PAN is a few meters (Less than 10 meters).

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Physical component of computer network.

connecting media of a network :-

→ connecting media includes both wire and wireless media through which the signals are send from one computer to another.

Wire media :-

→ computers can be connected by different kinds of media

(i) Twisted pair cables.
(ii) coaxial cables.
(iii) optical fibres.

Twisted pair cables :-

→ Twisted pair wires which consists of copper wires that are twisted in to pairs and the most widely used medium for telecommunications.

→ The twisted pair cable helps to reduce crosstalk and electromagnetic induction.

→ They are cheap and easy to install.

→ However this cables picks noise easily

when the length exceed by 100 meter.

co-axial cables:-

→ These are a highly prefered connecting medium for cable television system and for connecting the computers with in an office building.

→ The co-axial cable is highly resistant to signal interference.

→ The co-axial cable can support greater cable length.

→ It is difficult to install.

→ Its transmission speed varies from 200 million to 500 milion bytes per second.

Optical fibres:-

→ Optical fibres cable carry data as pulses of light.

→ They transmit light that can travell over a large distance.

→ Fibre optics cables are not affected by electromagnetic radiation and the transmission speed is 100 times of co-axial cable.

wireless media :-

→ The wireless media can be classified as
(i) microwave.
(ii) Satelite communication.
(iii) Intrared communication.

microwave :-

→ microwave use transmitor and receiver for data transmission.
→ microwave antena are placed usually on the top of buildings, towers, hills etc.

satelite communication :-

→ In satelite communication signals are transfered both the senden and receiver using a satelite i.e station in space.
→ This means that all the data transfer of signals happens. in space.

Ex :- TV signals.

Intrared communication :-

→ Intrared light is widely used by TV and ~~red~~ video casades recorder, remote controls.
→ In computers Intrared technology provides computing derices to communicate through a short range of wireless signals.

NOTE :-

Wi-Fi

→ It is a wireless networking technology which provides wireless internet and network connectio

Networking devices :-

→ The different networking devices are
(i) HUB.
(ii) Repeater.
(iii) Switch.
(iv) Bridge.
(v) Router.
(vi). Gateway.

HUB :-

→ A HUB is a device to which different devices are connected so that they can communicate with each other.

→ Every computer on the network is directly connected with the HUB.

Repeater :-

→ Network repeater are electronic devices that regenerate incoming electrical, wireless or optical signals.

→ A repeater connects two segment of the network cable.

Switch:-

→ A switch is a device that can be use in all places where a HUB is used.

→ It is much better than the hub because switch has a switching table.

Bridge :-

→ A Bridge is a device that connects two or more LANs.

→ when a bridge receives data from one LAN to forward it to another LAN it first regenerates the signal and then forward the data to the other LAN.

Router:-

→ A Router is an intelligent device that provides routes for the destination computers.

→ The Routers used special software known as routing table that stories the addresses of devices connected to the network.

Gateway:-

→ A Gateway is a very complicated network device that's basically used to connect two or more disimillar network that use different protocols.

→ A Gateway can be implimented in either software or hardware.

→ It provide security to the network.

Internet :-

→ The internet is a global network that connects bilions of computers all over the world.

→ It is a network of networks.

→ Each computer on the internet is called a host.

→ The internet some times known as the net.

WWW :-

→ It is known as world wide web.

→ It is an internet standard for distribu hyper text.

→ This means that WWW documents can have links to other documents which can be anywhere on the internet.

→ WWW was created in 1989 by Tim Berners Lee.

Internet services :-

→ Today the internet has become a part of organisations, Universities, office and Home users etc without the internet life has become not imaginable.

→ The different services are

(1) Electronic mail (E-mail).

(2) chatting.

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(3) Internet conferencing.
(4) Electronic newspaper.
(5) Online shopping.
(6) Search Engine etc.
(7) File transfer protocol (FTP) etc.

(1) e-mail :-

→ An e-mail is a means of transmission of messages electronically over communication network.
→ Hence e-mail is a method of exchanging digital messageses, designed for human use.

(2) chatting :-

→ chatting refers to a kind of communication over the internet that offers a real time transmission of text messageses from sender to reciever.
→ Chat messages are generally short in order to enable other participants to respond quickly.

(3) Internet conferencing :-

→ Internet conferencing allows users to carry on bussiness meetings and seminars, make presentations, conduct demonstration, provide online education and offered dine of customone support.
→ It always requires a high speed internet connections at all the user sides.

(4) Electronic newspapers-

→ An online newspaper also known as a wave newspaper or an electronic newspaper.

→ An electronic newspaper is a self contained, reusable and refreshable versions of a traditional newspaper that holes information electronically.

(5) Online shopping :-

→ Online shopping involve purchasing products or services over the internet.

→ Online shopping is done through an online shop, internet shop or online store.

(6) Search Engine :-

→ The world wide web (WWW) store a large amount of information on variety of topics in 100 of millions of pages. Therefore a search engine is used to help people find information stored on various sides.

Ex:- Google, Yahoo etc.

(7) File transfer protocol (FTP) :-

→ It is one of the oldest application of the internet which is basically used for transfering file from one computer to another.

known as a

newspaper.

contained,

ns of a

information

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h an online

store.

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E.g:-

Electronic mail (e-mail) :-

→ An e-mail is a means of transmission of messages electronically over the communication network.

→ E-mail is one of the most widely used services on the internet.

→ Any one who has an e-mail account can send an ~~em~~ e-mail to any other person who also has an e-mail account.

→ The structure of the ~~em~~ e-mail as :-

username @ domainname.

Ex :- abc123@gmail.com.

→ using the option compose e-mail we can send message to our friends.

→ An e-mail has the following fields.

TO.
Subject.
Body.
CC
~~BCC~~
BCC.

TO - In this field the e-mail address should be right

Subject - In this field we place the content of the message.

Body :- In this field we gives some details about the Subject.

CC and Bcc :-

CC stands for carbon copy and Bcc stands for Blind carbon copy.

Different types of internet connectivity :-

→ There are many different types of connec
(1) Dialup connection.
(2) ADSL connection.
(3) cable connection.

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(1) Dialup connection :-

→ The most basic type of internet connection is called a dialup connection.
→ This connection is made through a modem that uses a telephone line to connect to the internet.
→ The modem must dial the telephone every time it once to connect to the internet.

Advantages :-

→ Dialup connection can be very economic and are widely available.

Disadvantages :-

→ Dialup connections are very slow compare than other connection type.
→ when connected to the internet the same phone line can not be used for same phone calls, hence if any one

phones you when you are connected they will get the busy signal.

(2) ADSL connection:-

→ ADSL is known as Asymmetric digital subscribers line.

→ These connection are becoming more and more be available and can provide an excellent internet connection.

→ The connection work by spliting your phone line into two separate channel i.e one for data and other for voice, which means you can talk on the phone and be connected to the internet at the same time.

Advantages:-

→ ADSL technology eliminates the need for a second phone line by allowing voice and data transfer at the same time.

DisAdvantages:-

→ Handware cost is more and are not available to every one.

(3) cable connection:-

→ cable connection are consider one of the best type of internet connection available to the home user.

→ cable companies usually offered different packages for different internet subscribers.

Advantages:-

→ Speed is more.

→ cable connection are always on. Eliminating long ways to make a connection.

Disadvantages:-

→ cable connection are not available in every area.

→ Because cable connections are always on. you will need a firewall to protect your PC.

ISP (Internet service provider):-

→ It is known as internet service provider

→ An Isp is a company that provides individual and other companies acces to the internet and other related services such as website building.

→ The largen ISP have their own high speed leased lines, so that they can provide better service to their customers

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File management and data processing:-

→ In GUI (Graphical User Interface) based operating system such as windows we have files and folders in which data are organised during storage in computer memory.

→ The unit of raw data in binary format is either Byte or Kilobyte (KB) or megabyte (MB), Gigabyte (GB), Terabyte (Tb) etc.

→ A Byte is the smallest unit of information and is used to measure the size of our documents.

→ One Kilobyte (KB) = 1024 Bytes.

1 MB = 1024 KB.

1 GB = 1024 MB.

Imp.:-

Files:-

→ A file is a group of Bytes.

→ Files are the most basic unit of data that users can store on a disk.

→ One can create, save, open, move, close, and delete files.

→ There are different types of files depending on the time of information they contain. These are image files, Program files, text files, music files etc.

→ To distinguish the type of files we use extension for different file name.

Ex:- abc.doc.

123.JPeg.

Folders :-

→ A folder is a collection of multiple files.
→ A folder holds one or more files and it can be empty with just a name.
→ The folders are used to classify the files in your computer.

Difference between a file and a folder :-

File	Folder
→ File stores data while a folder stores files and other folders.	
→ Folders usually take no space in the hard drive while files take a few Bytes to GB space in the hard drive.	
→ Folders are normally bigger in size as they hold many files and other folders.	

File access methods :-

→ An access method defineds the techniques i'e used to store and retrey data.
→ It is also used describe the way that data is located within a largen unit of data.
There are 2 types of access method :-
(i) Random access / Indirect access.
(ii) Sequential access.

Random access :-

→ A file made up of fixed length logical records that allow programs to read and write records rapidly in no particular order.

That means there is no restriction on the order of reading or writing for a direct access file.

→ The direct access is based on a disk model of a file.

→ For the direct access method the file is must include the block number as a parameter.

→ The first relative block of the file is zero(0), the next is one (1) and so on.

sequential access:-

→ The simplest access method is sequential access. Information in the file is processed in order i.e. one record after the other.

→ This mode of access uses beginning as the current position.

→ Reads and writes make up the bulk of the operations on a files.

ISAM :-

→ It is is known as indexed sequential access method.

→ This method is a static, Hierarchile disk index structure.

→ It initially stores records sequentially and permits both sequential and Random processi

→ The main features of this method are the uses of indexes to locate a current record and keeys for finding out the record on a track.

Ex:- Employee data base.

Data capture :-

→ Data capture is the process of identification and extraction of data from a scan documents.

→ methods of capture from documents in electronic formats are follows :-

(1)- OCR - (Optical character Recognition)

(2)- ICR - (Intellectual character Recognition)

(3)- Barcode Recognition.

(4) - IDR - (Intelligent document Recognition)

Data storage :-

→ Data storage is the holding of data in an electromagnetic form access by computer.

→ The following devices are used for data storage.

(1) Harddisk.

(2) Floppy disk.

(3) Tapestorage.

(4) CD / DVD. - (compare disk), (Digital ventral disk).

(5) Pendrive.

(6) memory card etc.

Data processing :-

→ Data must be processed in order to convert it into useful information.

→ The data processing can be perform through the following method :-

(1) manual data processing.

(2) mechanical data processing.

(3) Electronic data processing.

(1) Manual data processing :-

→ In manual data processing data is processed manually without using any machine or tool the get the results.

Ex:- mark sheet, fee receipt and other binancial calculation are performed by hand.

(2) mechanical data processing :-

→ In mechanical data processing method data is processed by using different devices like typewriter, mechanical printer or other mechanical devices.

(3) Electronic data processing :-

→ Electronic data processing is the modern technique to processed data.

→ The data is processed through computer

→ This method of processing data is very fast and accurate.

Data Retrival :-

→ Data is one of the most important access of any bussiness.

→ Data recovery is the process of restoring data that has been loss, accidentally deleted corrupted etc for any reason.

→ Lost file can occurs because of

(1) File was mistakely in deleted.

(2) File was corrupted.

(3) Another program deleted the file.

(4) File is password protected.

Problem solving methodology :-

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→ We know that computer cannot solve any problem on its own. For this we need to write a program in a programming language. The computer then exicutes that program and perfo the task mentioned in the program.

→ We use algorithm, Pseudocode and flowch for solving problem of a computer.

Algorithm :-

→ An algorithm can be defined as a step by stem method for writting the varius steps of the solution to a problem.

characteristics of algorithm :-

→ Algorithm should be definite.

→ Algorithm should have finite numbers of steps

→ Algorithm should mention the input required for the program clearly.

→ Algorithm should give an Idea the output that will be obtained.

ex:- Write an algorithm to prints all the 2digit odd numbers.?

Ans:- step-1:-

Initialize a variable NUM with 11.

step-2:-

Print the variable NUM.

step-3:-

Add 2 to the NUM.

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solve any problem
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required

output

2digit

11.

step-4 :-
Go on repeating step-2 and step 3, until NUM become more than 99.

Pseudocode :-

→ Pseudocode is a set of code which may not be written by correct syntax of the code. It is used as a program planning tool before writting a computer program.

Ex:- write an pseudocode to print all the 2 digit odd numbers?

Ans:- step-1 :- START or BEGIN.

step-2 :-
set NUM = 11.

step-3 :- print NUM.

step-4 :- set NUM = NUM + 2.

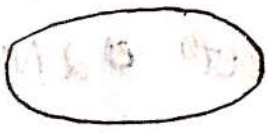
step-5 :- If NUM <= 99 than repeat step-3 and step-4.

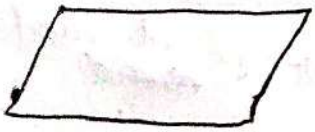
step-6 :- STOP or END.

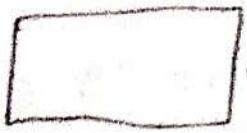
Flow chart :-

→ It is a graphical or pictureial representation of a computer program. Flowchart can be written by using a set predefined symbols.

→ ~~which~~ while drawing a flowchart we use different symbol to content different types of statements of the problem solving logic.


start / stop.
(oval).


input / output.
(Parallelogram).



- calculation (Rectangle).

Decision Box (Rombus).

control flow.

(c) - for control.

Advantages of flowchart:-

→ It is easy to create.

→ It is easy to interpreate.

→ It can be used as a program planning document.

→ It is easy to modified.

→ ~~Long~~ Long and complecated problem solution can be represented by small and simple flowcharts.

Disadvantages of flowchart:-

→ Some time it become difficult to represent ~~the~~ problem solution in flow chart if it contains contain specific type of structures.

→ Some times it is difficult to convert into a program

Ex:- Find out the larger of NUM both of 2 Num.

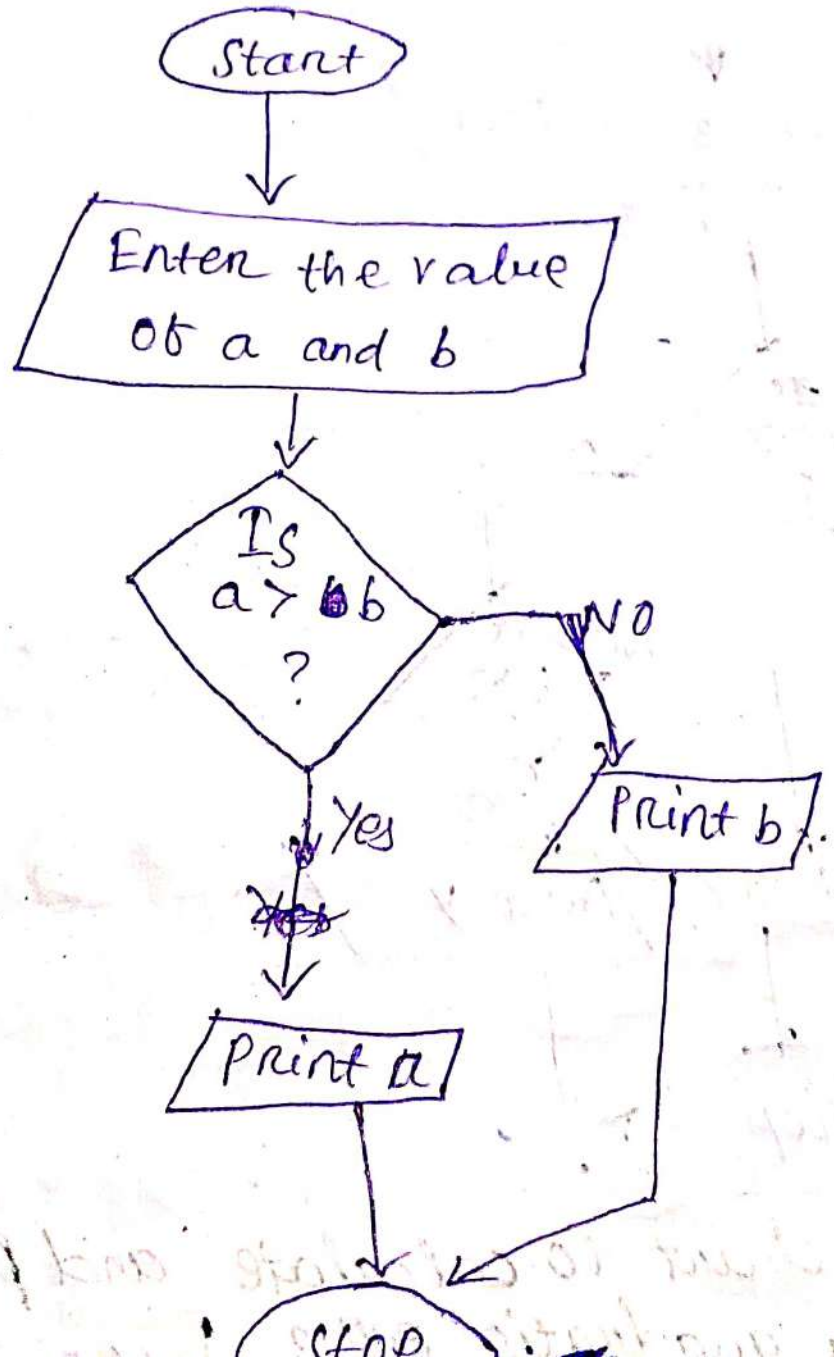
Ans:- In algorithm:-

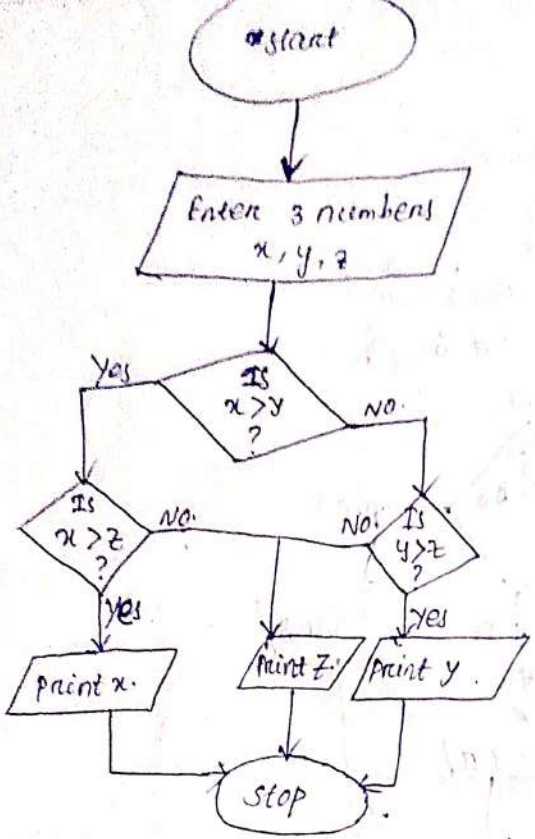
Step-1:- Enter two numbers a and b.

Step-2:- If a > b a is larger else b is

Step-3 :- Print the largen value a or b.

In flowchant :-





(Q) Draw a flow chart to calculate and print the roots of a quadratic eqn?

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

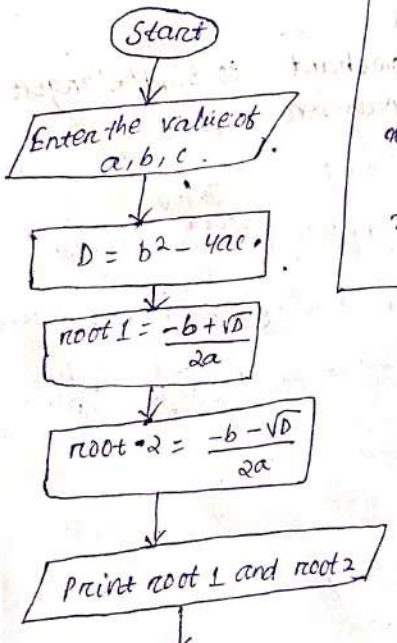
$ax^2+bx+c=0$

$D = b^2-4ac$

$$x_1 = \frac{-b+\sqrt{b^2-4ac}}{2a}$$

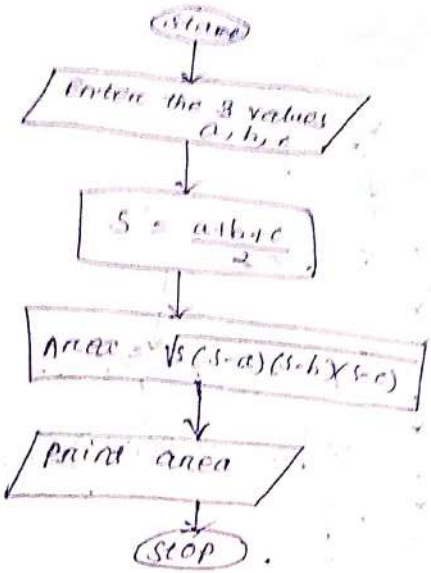
$$x_2 = \frac{-b-\sqrt{b^2-4ac}}{2a}$$

Ans:-



7) Draw a flowchart to calculate of a triangle whose 3 sides are a, b and c.

Ans:-

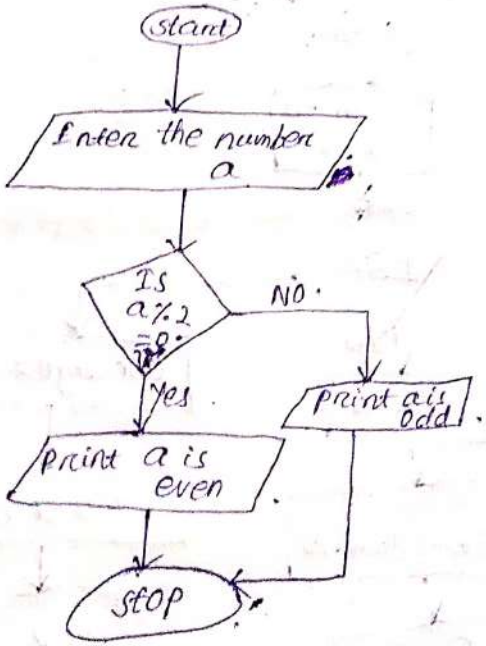


Area = $\sqrt{S(S-a)(S-b)(S-c)}$

where $S = \frac{a+b+c}{2}$.

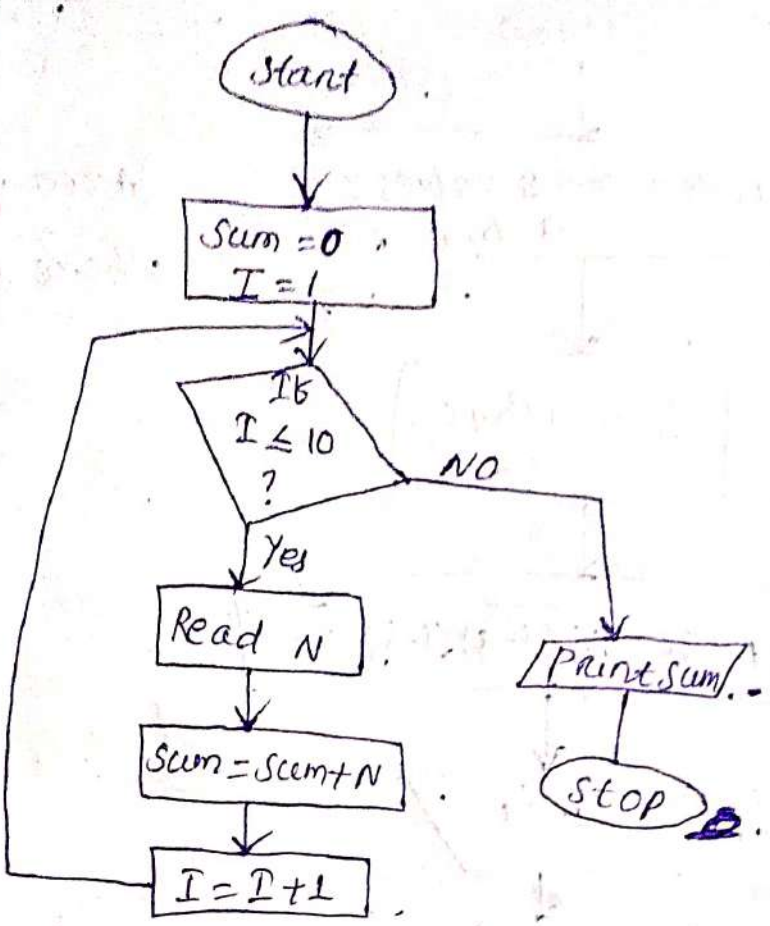
(8) Draw a flow chart to test wheather a number is even or odd?

Ans:-



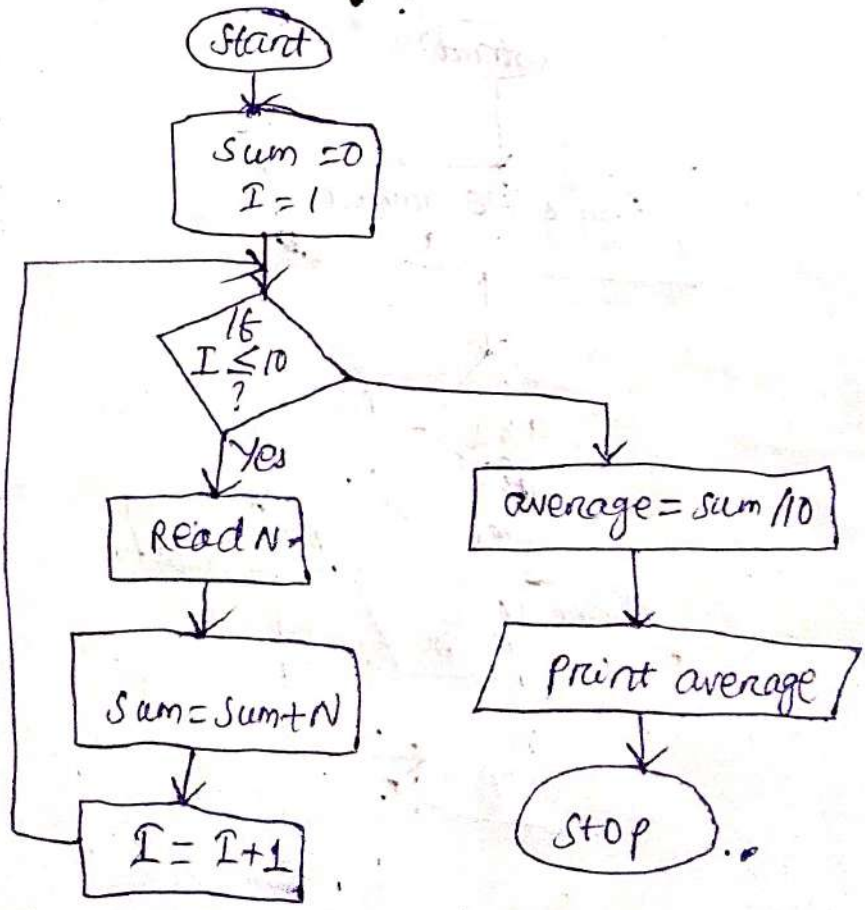
(8) - Draw a flow chart to find sum of 10 random numbers?

Ans:-



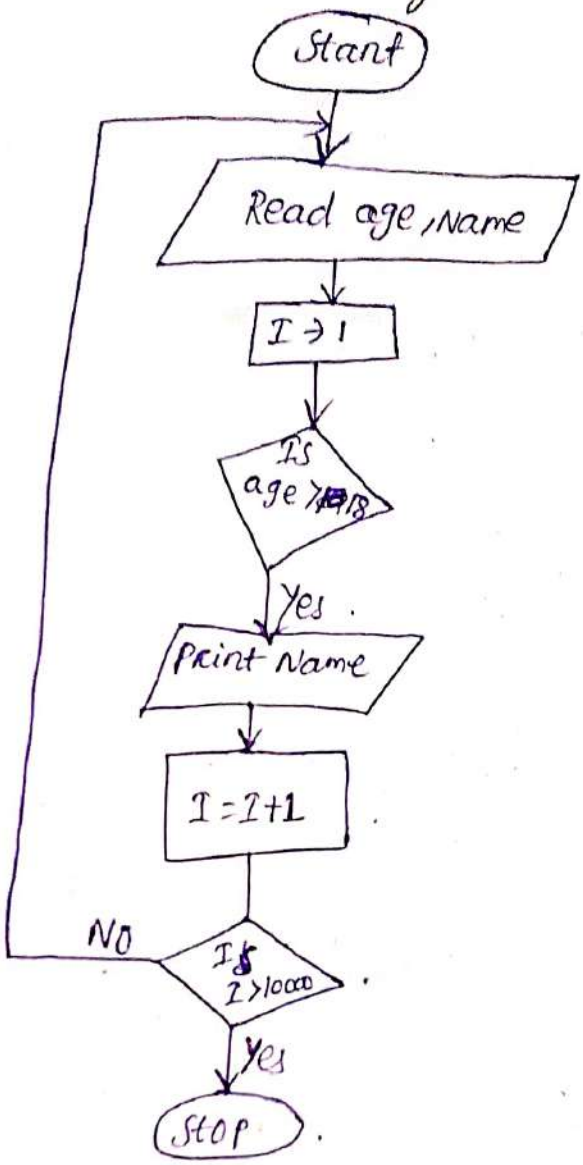
(9) Draw a flow chart to print the average of 10 random numbers?

(Ans)



(8) Draw a flow chart which prints the names of citizen eligible for voting in a city of 10000 population where the eligibility is the person should be more than 18 years of age?

Ans:-



(9) Draw a flow chart to accept a given number and test. If it is odd or even?

Ans:-