Computer Application in Management

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* **Computer :→** A computer is an electronic machine, which accepts raw information as input and reveals useful information as output.

Characteristics :→

① **Automatic :—** An automatic machine works by itself without human intervention. computers are automatic machines because once started on a job, they carry out the job until it is finished.

② **Speed :—** A computer is very fast device. It can perform in a few seconds, the amount of work that a human being can do in an entire year. Speed of computers are measured in terms of microseconds (10^{-6}), nanoseconds (10^{-9}), picoseconds (10^{-12}),

③ **Accuracy :—** Computer are very accurate. Accuracy of computer is consistently high and degree of its accuracy depends upon its design. A computer perform every calculation with same accuracy.

④ **Diligence :—** Computer is free from tiredness and lack of concentration. It can continuously work for hours without creating any error and without grumbling.

⑤ **Versatility :—** It is a versatile device. One moment it is preparing results of an exam, next moment it is very busy in preparing electricity bills and in between, it may be helping an office secretary to trace an important letter in seconds.

⑥ **Power of remembering :—** A computer can store and recall any amount of info. because of its secondary storage capability. It can retain a piece of information as long as a user desires and the user can recall the information whenever required.

⑦ **No. I.Q :—** A computer is not a magical device. It possesses no intelligence of its own. Its I.Q is zero, at least until today. It has to be told what to do and in what sequence. Hence, only a user determines what tasks a computer will perform. A computer cannot take its own decision in this regard.

⑧ **No Feelings :—** Computers are free of emotions. They have no feeling because they are machine. They make judgement based on the instructions given to them in the form of programs that are written by us.

* **History of Computers :→** The history of computer starts from 600 BC when first calculating machine was introduced. We can divide the entire development of computers in three parts and acc. to this division there are three types of machine developed at different times. These computers are :→

① **Manual Computers :→** The very first manual calculating machine was a digital computer known as 'abacus' or 'soroban'. These device uses beads on wire frame. This frame has two parts – upper & lower. The upper part is called heaven and the lower part as Earth. The heaven part contain two beads and Earth part five beads per wire. A raised bead in heaven denotes zero whereas a lowered beads has a weightage equal to the digit 5.

Another manual calculating device was napier bones. It was invented by a Scottish mathematician John Napier. He used a set of eleven rods called bones with numbers carved on them. Napier's bones helped a lot in calculation work requiring multiplication and division involving large numbers. They are also known as log or logarithms.

② **Mechanical Computers :→** The first mechanical device was invented by Blaise Pascal in 1642. This machine was known as adding machine because it could only add or subtract. The principle of this machine was similar to clock work mechanism.

Pascal calculating machine was changed into better calculating machine known as Leibnitz calculator. It could perform all basic arithmetical functions i.e. addition, subtraction, multiplication and division easily.

In 1882 Charles Babbage, who was a professor of Mathematics at cambridge university, demonstrated a working model of another calculating machine to which he called difference engine. In 1884, he proposed another machine named Analytical engine and was essentially, a general purpose automatic calculator. It was capable of performing all arithmetic operations at the speed of 60 additions per minute. Unfortunately, he was ~~capable~~ unable to produce a working model of his machine but you will be surprised to know that basic principle of operation used by him and basic organisation of unit is same as that in present day computers. Because he gave basic concepts therefore he is known as father of computers.

(3) Automatic Computer :—>

(i) The Mark I computers (1937-1944):— Also known as Automatic sequence controlled calculator. This was first fully automatic calculating machine designed by Howard A. Aiken of Harvard University in collaboration with IBM. It was an electromechanical device and the instruction were entered by means of punched paper tape.

(ii) The Atanasoft-Berry computers (1939-42):— The electronic machine was developed by Dr. John Atanasoft. It was called the Atanasoft-Berry computer after its inventor's name and his assistant clifford Berry. This was an electronic machine using 45 vacuum tubes for internal logic and capacitors for storage.

(iii) The ENIAC (1943-1946) :— The electronic Numerical Integrator And calculator was first of all electronic computers. It was developed by a team led by professor J. Presper Expert and professor John Mauchly.

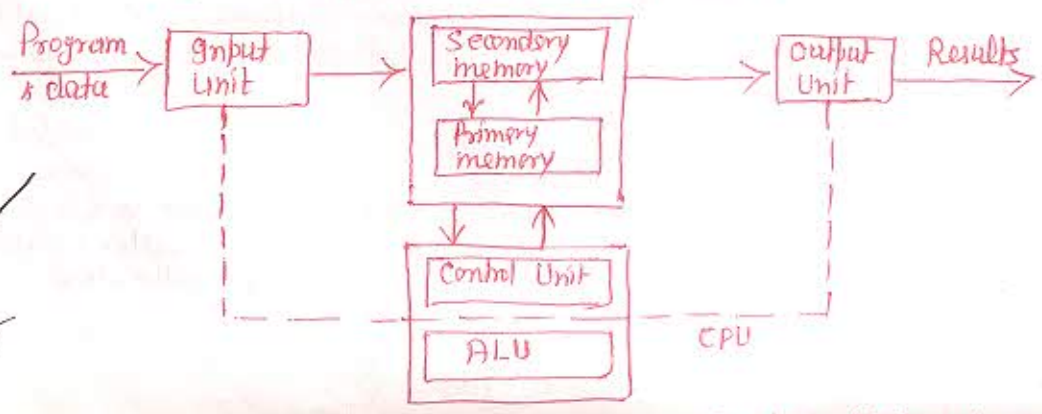
(iv) The EDVAC (1946-1952) :— The operation of ENIAC was seriously handicapped by the wiring board. This problem was corrected by the new concept of 'stored program' developed by Dr. John Von Neumann. The Electronic Discrete Variable Automatic Computer was designed on stored program concept.

(v) The EDSAC (1947-49):— The Britishers developed the Electronic Delay Storage Automatic Calculator.

(vi) The UNIVAC I (1951):— Universal Automatic Computer was first digital computer built by Remington Rand.

** Basic Anatomy of Computers :—> Computer Orgn

All computer system performs the following five basic operations. ① Inputting :—> The process of entering data & instructions into computer system. ② Storing :—> Saving data & instructions so that they are available for initial or for additional processing as & when required. ③ Processing :—> Performing arithmetic operations or logical operations on data in order to convert them into useful information. ④ Outputting :—> The process of producing useful information or results for the user, such as a printed report or visual display. ⑤ Controlling :—> Directing the manner and sequence in which all of above operations are performed.



Input Unit :→ Info. is entered into a computer through input device. All input device reads the data and program into the computer. The program contains instructions about what has to be done with data. It provides a way of man to machine communication. An input device converts input information into suitable binary form acceptable to computer. Some popular input device are listed below:— keyboard, mouse etc. The functions performed by input unit are:— ① It reads/accepts data & instructions from outside world. ② It converts these data and instructions received from outside world. ③ It supplies these converted data and instructions to CPU for further processing.

Output Unit :→

The output device receive results and other information from the computer and provide them to the users. The computer sends info. to an output device in the binary form. An output device converts it into a suitable form convenient to users such as printed form, display on a screen, voice output etc. e.g. Printer, Plotter. The functions performed by an output unit are as follows:→

① The output unit accepts the coded result from computer after the processing.
② It converts these binary coded results/info. into human readable form.
③ It supplies the converted result to the external world in the user required form.

Storage Unit :→

The function of storage unit is to store info. The data & instruction that are entered into computer system through input unit have to be stored inside the computer before & after actual processing. The functions of storage unit are as follows:— ① The data & instructions received from input unit are stored in it before processing. ② It store the intermediate result of processing. ③ It stores the final result of computations and when required send it to the output unit.

Central Processing Unit :→

The CPU is the brain of computer. Its primary function is to execute programs. Besides executing programs, the CPU also controls the operation of all other components such as memory, input and output devices. The major section of a CPU are:- ALU & CU. ① ALU :→ The ALU is the main component/unit of CPU which performs actual execution of instruction and programs. As the name tells, it performs all arithmetical calculations and logical comparisions. The control unit transfer data and instructions in ALU, one by one for processing. The main functions performed by ALU are as follows:→ (i) It accepts data and decoded instructions from main memory and control unit. (ii) When it gets signals from CU, it performs arithmetical calculations and logical operations acc. to current instructions in it. (iii) It returns the final result to main memory for storage (iv) All instructions are executed in it and it is the main processing unit of computer. ② CU :→ The control unit act as a central nervous system for other components of computer. Though, it does not perform anything in actual processing but it controls all the actions of ALU and main memory. The functions of control unit are as follows:— ① It controls the operations of all other blocks and units of the computer system by issuing them signals time to time. ② It fetches the instructions of program stored in main memory one by one in step wise manner. ③ It decodes/interprets the instruction by separating the operations code and operands. ④ It issues proper signals for data transfer in ALU and instructs ALU to perform required job. ⑤ It sends intermediate results and final results in main memory for storing it.

*** Classification of Computers :→

* By Functional Criteria :→ Acc. to functional criteria, computers are divided into three parts :→

① Digital Computer :→ Digital computers takes input in the form of numbers, letters and special characters. They store and process the input and give the output in the same form. Digital computers can add, subtract, multiply divide and compares. These computers provide highly accurates results.
e.g. – Digital Calculators, Electronic computers.

② Analog Computer :→ Analog computer donot process digital data. Instead, they operate on continuously variable quantities like temperature, pressure, revolution etc. They react in a predefined way to change in the specified quantities. Analog computer is faster than the digital computer. They can give accurate result upto 90%. These computers are used as controlling device in factories, military weaponry, aerospace systems. etc. e.g. Speedometer, Voltmeter, wall clock.

③ Hybrid Computer :→ A hybrid computer is one that contains both a digital and an analog circuit. In these computers, the digital circuit normally serve as controller and provide logical operations. The Analog computer usually serves as a solver of differential equations. In other words, measurement process is done by analog computer and depending on these measurement the calculation / processing is done by digital computer and result is supplied in digital form to user.

* Acc. to purpose there are two types of computers :→

① Special Purpose Computer :→ They are designed to handle particular task. The sequence of instructions is encoded permanently on the circuit. e.g. Navigation computer used in aircraft. The can measure the reaction times reliably

② General Purpose Computer :→ They are designed to handle various general task. The instructions are not permanently circuited. e.g. computer used for data processing like IBM-360. They can measure reaction times reliably.

* Acc. to use there are two types of computers :→

① Scientific Computers :→ In the scientific computers, processing speed is very high, I/o devices are slow. They are suitable for mathematical applications eg. Design of Aircraft engine, bridges, building etc.

② Business Computers :→ In these computers processing is slow. I/o devices are very fast. Suitable for jobs involving large input and outputs. eg census data, insurance, payroll, inventory etc.

* Acc. to capacity Performance there are four types of computer :→

① Micro Computer :→

These computers are also known as personal computers. The characteristics of these computers are as follows :—

(i) They use very little power. They need very less air-conditioning.
(ii) The smallest category of a computer, consisting of a microprocessor, storage and i/o elements is known as microcomputer.
(iii) These systems memory size ranges from 256 KB to 8 MB. Their wordlength is 8, 16 or 32 bits.
(iv) Max. speed of microcomputer is upto 1 million bytes per seconds.
(v) They are stable and reliable. Once tested and proved, they can work for years without hitch (obstacle).
(vi) They are generally single user. They can support upto max. 2-3 terminals, when we make multiuser.

② Mini Computer :→

Mini computers have following characteristics :→

(i) These are more powerful than a micro-computer.
(ii) They usually employ microprocessors, both for data storage as well as data manip^{n}.
(iii) They are designed to serve multiple users simultaneously.
(iv) They can support upto a max. of 20 terminals
(v) They can accept and transfer data from I/O devices at the max. speed of one million bytes second.
(vi) These systems are characterised by their main memory size that ranges from 512 MB to 1 GB.
(vii) There are popular among research and bus. organisations.
e.g. Digital PDP 11, Honey well, HCl II.

③ Mainframe Computer :→

It have following characteristics :→

(i) They can support a large number of terminals may upto 100 or more.
(ii) Speeds of these computer is several million bytes per second.
(iii) They can accept all types of high level languages like C, C++, Java, C# etc.
(iv) They are larger and/or expensive.
(v) They are used for scientific & commercial application both.
(vi) They are mainly used for Railway & Airline Reservation, banking application, commercial applications like insurance and hospitals. e.g. IBM 360, Dec10 etc.

④ Super Computer :→ It can perform billions of calculations per second. It can perform over ten million floating point operations per second. It is extremely fast. They support parallel processing. They are used in following fields like medicine, defence, weather information, real time animation, nuclear energy research, electronic circuit design etc.

** Hardware and Software :→

* Hardware :→

Hardware refers to all physical entities of machine which can be touched or seen with eye e.g. keyboard, mouse etc. OR The physical components of computer are called h/w. It helps to run the s/w. The h/w configuration shows capabilities and limitation of any computer system.

* Software :→

A set of programs to be fed into computer to achieve the desired result is called s/w. s/w is a set of computer programs which are designed and developed to perform specific task desired by user or by computer itself. So s/w makes the computer to do work. There are two types of s/w :-
(i) system s/w (ii) Application s/w.

(i) System s/w :→

The system s/w is collection of programs designed to manage and control the computer system. System s/w s are generally provided by computer manufactures. These s/w s perform a variety of functions like memory management, resource accounting, I/O management, file mgt. etc. e.g. operating systems and utility programs.

(ii) Application s/w :→

Application s/w is the program or set of programs used to perform various tasks. All programs prepared by user and for user come under category of application s/w. Application s/w is unable to run without system s/w. e.g. payroll s/w, inventory control s/w, spreadsheet, word processor etc.

Application s/w	System s/w
1. These are interactive in nature.	1. These are less interactive in nature.
2. These are easy to manipulate.	2. These are difficult to manipulate.
3. They are easy to understand.	3. Difficult to ~~maintain~~/understand.
4. It is user oriented s/w	4. System oriented s/w.
5. Execution speed is s/w	5. Execution speed is fast.
6. These are written in HLL.	6. in LLL.
7. e.g. Payroll system, railway reservation, spreadsheet etc.	7. e.g. operating system, Compiler, Loader, Linker etc.

H/w	S/w
1. The physical components of a computer are called h/w.	1. A set of programs that are fed into ~~other~~ computer to get desired result is called s/w
2. These are the physical entities which can be touched with hands or seen with the eyes.	2. s/w can not be touched with the hands or seen with eyes.
3. It helps to run the s/w.	3. Without s/w, h/w is nothing.
4. H/w determines the type of computer i.e. mini, micro, mainframe etc.	4. ~~System~~ s/w's are of two types:- System s/w and application s/w

** Memory :→

Memory is a group of cells that stores data and programs in the form of 0s and 1s. These cells are also called storage locations, where each location has a unique address. The memory of computer is often called primary or main memory. It is also known as RAM.

A byte is the smallest unit of memory. Usually the capacity of memory is measured in Kilobyte (KB), Megabyte (MB) or Gigabyte (GB).

1 Byte = 8 bits, 1KB = 2^{10} bytes (1024 bytes), 1 MB = 2^{10} KB = (1024 kB), 1 GB = 2^{10} MB = (1024 MB)

* Primary Memory :→

Primary memory is necessary to run computer properly. It is also known as main, internal, volatile or semiconductor memory. There are types of it. (i) RAM (ii) ROM

(i) **RAM** :→ RAM is read and write memory in which data and instruction can be written or read from. It is volatile i.e its contents are lost when power is turned off because it is made of semiconductor material as silicon or germanium.

(ii) **ROM**:→ In ROM, instructions are written permanently in the form of small programs such as BIOS that are necessary for booting and other functions of a computer. A programmer can not modify instructions in a ROM chip.

- **Types of RAM** :→ (i) Dynamic RAM (ii) Static RAM
- **Types of ROM**:→ (i) EROM – Erasable Read Only Memory.
  (ii) PROM – Programmable Read Only Memory.
  (iii) EPROM – Erasable and Programmable Read Only Memory.
  (iv) EEPROM – Electronic Erasable Programmable Read Only Memory.

* Secondary Memory :→

Secondary memory is external to the computer which is why it is also called external or auxiliary memory. They are mag. core memory or optical memory. Secondary memory stores data in permanent form which can be read or written to. It is non-volatile in nature: because it is made up of magnetic material. Mag. disks, tapes, & CDs are example of secondary memory.

* Cache Memory :→

Cache Memory is a semiconductor memory placed bet CPU & RAM. It is used to increase the interchange bandwidth bet RAM and CPU that increase the data exchange speed bet CPU & RAM. It is a small high-speed memory. The cache memory is only in RAM.

* (1) Difference bet. Primary & Secondary Memory :→

Primary Memory	Secondary Memory
(1) It is volatile in nature	(1) It is non-volatile in nature.
(2) It has faster access time	(2) It has slower access time as compared to primary memory.
(3) Storage capacity is very limited	(3) Storage capacity is vast.
(4) Cost per bit storage is high	(4) Cost per bit storage is very low.
(5) Primary memory is semi-conductor memory.	(5) Semiconductor memory is mag. memory.
(6) This is inside CPU, hence called internal memory.	(6) This memory is outside the CPU, hence called external memory.
(7) It is difficult to handle & transport.	(7) It is easy to handle & transport.
(8) A primary memory is accessed randomly.	(8) A secondary memory can be accessed sequentially as well as randomly depending on storage device.
(9) It is essential part of memory.	(9) A secondary memory is optional part of memory.
(10) Example:- RAM & ROM	(10) Example:- Mag. tape, Mag. disk, optical disk.

** Mag. Tape:→ A mag. tape is a back up storage device and is very similar to audiocassete. It is one of most popular storage device for storing large volume of data. The data stored on mag. tape can be erased and reused over and again. Typically the width of tape is 0.5 inch and length is 2400 feet. The length of tape may be 50 to 2400 feet long. The recording density of tape is expressed in character per inch (CPI). Generally 800, 1600 or 2500 characters can be recorded per inch of length of a tape.

A tape drive is also known as streamer, is a data storage device that reads and writes data stored on a mag. tape. Data is recorded on a mag tape in the form of magnetized and non-magnetized spots. Magnetized spots represent 1s (ones) and non-magnetised spots represents 0 (zeros). The tape is divided into vertical column called channels or tracks. A character is recorded in a frame by using a code such as BCD (Binary Coded Decimal) or EBCDIC (Extended binary coded decimal Interchange code). A mag. tape having 7 tracks that shows the recording of each character in a seperate frame.

- Advantages of Mag. tape:→
  1. Storage Capacity:→ The storage capacity is very large. ✓
  2. Portability:→ It is portable.
  3. Cost:→ Mag. tape is one of cheapest storage media. The cost per bit of storing data on tape is very less.
  4. Any Length Record:→ It can store a record of any length
  5. Reusable:→ The data can be deleted and another data can be stored at same place. Thus space can be used any. no. times.

- Disadvantage of Mag. Tape: →

① Non-Flexibility :— Mag. tape is not a flexible media.

② Transmission Speed :— The rate of data transfer is very slow in mag. tape due to serial nature of the device.

③ Access Time:— All the records access time is very large in mag. tape.

④ Vulnerable to Damage:— Mag. tape are highly vulnerable to damage (चाव पहुंचाने योग्य) from dust or careless handling.

⑤ Environmental Problem:— The tape unit is susceptible to speeks of dust, humidity and high temperature causing I/O errors.

** Mag. Disk : → Mag. disks are the most popular direct-access secondary storage device. A mag. disk is a thin circular platter made of metal or plastic and coated on both sides with a recording metal that can be magnetized such as iron oxide. Data are recorded on a disk in the form of tiny invisible magnetized and non magnetised spots representing 1s & 0s on the coated surface of disk. A std. binary code, usually 8-bit EBCDIC, is used for recording data. Mag. disk can also be erased and reused indefinitely.

The disk is mounted on a spindle, connected to a motor. Motor rotates it at a very fast speed of order of 3600 rpm. Each disk is divided into number of tracks, each track is further subdivided into sectors. In a Disk-Pack of six disks, there are 12 surface Top surface of first and bottom of last are not used for reading or writing, 10 surfaces are used for storage purpose, capacity of disk can be measured. Let us say there are 10 surface, each surface has 512 tracks, and each track has 40 sectors and each sector can store 512 bytes then $10 \times 512 \times 40 \times 512 \simeq 100$ Megabytes

- Advantage of Mag. Disk: →

① Storage Capacity: → It can store very large amount of data.

② Transmission Speed: → Rate of data transfer is fast in mag. disk.

③ Access Time: → Access time is less.

④ Reusable: → Data can be deleted and reused that is stored on disk.

⑤ Flexibility: → It is flexible being used as sequential as well as direct access storage.

- Disadvantage of Mag. disk: →

① Cost:— Cost per bit/character storage is much higher

② Non human readable:— Data stored on it is not readable by human.

③ Non-portability:— Portability is very less compared to mag. tape.

④ Limited size record:— Length of record which can be stored on it is limited by size of disk track or disk sector.

⑤ A mag. disk is less efficient as far as sequential access to record is concerned.

*** Hard Disk :→ Harddisk are the primary online secondary storage device. They are made up of rigid metal (aluminum) platters and come in many sizes ranging from 1 to 14-inch diameter.

* Types of Hard-disk :→

① Zip/Bernauli Disk :→ It consist of single hard disk platter encased in plastic cartridge. The disk is commonly of 3½ inch size having storage capacity of about 100 MB. The storage capacity slightly varies depending on the formatting styles used by a computer system with which it is used. Its disk drive, called Zip drive may be portable or fixed type.

② Disk Pack :→ It consist of multiple (two or more) hard disk platters mounted on a single central shaft. All the disk revolve together at the same speed. Its disk drive has a separate read/write head for each disk surface.

③ Winchester Disk :→ A winchester disk consist of multiple hard disk platters mounted on single central shaft. Unlike a disk pack drive, winchester disk drive is of fixed types, that is, its hard disk platters and disk drives are sealed together in a container and can not separated from each other. Winchester disk have limited capacity.

*** OPTICAL Disk :→ An optical-disk storage system consists of rotating disk coated with a thin ~~film~~ metal or some other material that is highly reflective. It uses laser beam technology for recording reading of data on disk surface. Optical disk are also known as laser disk or optical laser disk because they uses laser beam technology for data read/write.

* Types of Optical Disk :→

- Compact Disk (CD) :→ CD is non-erasable disk that stores digitized audio information. The standard system uses 12 cm disk and can record more than 60 minutes of uninterrupted playing time.
- CD-ROM :→ CD-ROM is the latest storage device, used to store data, information and s/w, which can be read only and not be changed or erased.
- WORM :→ This is "Write once Read Many" device. This is another laser based writable optical storage medium. Data is recorded on a blank optical disk using laser recording device. Recorded area represent binary '1' and blank area represent '0'.
- CD-I :→ Compact Disk Interactive is a specification based on the use of CD-ROM. It describes method for providing audio, video, graphics, text and machine executable code on CD-ROM.
- CD-R :→ This allow the users to master a CD-ROM or audio CD for publishing.
- Erasable optical Disk or CD-RW Disk :→ This disk can be repeatedly written and over written, as with any mag. disk.
- OPTICAL Card :— can store 2MB of data.
- DIGITAL VIDEO DISK :— It holds 15 times as much info. and 20 time faster than CD-ROM.

** Input Devices: → The input devices are the primary means by which one can interact with their computer. These devices convert the information into machine readable form before it is entered into the system.

* Keyboard: → This is the most common and very popular input device especially for entering text data. The layout of keyboard is same as that of typewriter with some additional keys. The no. of keys vary from 83 to 104 in different keyboards. Acc. to no. of keys, there are four types of keyboards, 83 keyboards, 101 key keyboard and 104 key keyboard. The keyboard is connected to serial port interface to the computer. Different keys of keyboard are as follows:— Function key, Alphabetical key, Numerical key, Logical keys, Arithmetical & mathematical keys, special keys etc.

* Mouse: → It is very popular device used to control the cursor or pointer on the display screen. The technique used to obtain different functions from the mouses are termed as clicking, Double clicking, Dragging etc. There are three types of mouses are:—

① Mechanical Mouse: → Mechanical mouse has a rubber or metal ball under its base that can roll in all directions. Mechanical sensors within the mouse detect the direction of ball in which it is rolling and move the cursor accordingly on the screen.

② Optometrical Mouse: → Optometrical mouse is same as a mechanical mouse, but it uses optical sensors to detect the motion of ball. The accuracy is more than a mechanical mouse.

③ Optical Mouse: → Optical mouse uses a laser to detect the mouse's movement. The mouse has to move along a special mat with a grid so that the optical mechanism has a frame of reference. Optical mouse has no mechanical part

* Joystick: → Joystick is a manual device which is connected to a computer. It has a control liver that can be moved or tilted in various directions for moving cursor to any position on the CRT Screen. The devices is used with graphics and is commonly used with games.

* Scanner: → It is an input device which works more like a xerox machine. It is used when some information is available on a paper and is to be transferred to the hard disc of computer for further ~~info~~ manipulation. It captures images from the sources which are then converted into digital form. That can be saved on the disc. These can be edited before they are printed. A scanner can convert an image into light and dark pixels in black and white and color if colored printer.

* **Light Pen:** → Light Pen is another pointing device. A light pen connected to a computer can be used to draw graphics directly on the monitor screen. It can accept the light of screen and can choose objects or commands from there. When a tip containing the light sensitive element is touched on the screen, a signal is sent to the system.

* **Digitizer:** → A digitizer is a device that converts ~~often~~ analog information into a digital form. It can convert a signal from the television camera into a series of numbers that could be stored in computer. They can be used by computer to create a picture of whatever the camera had been pointed at. It is also known as Tablet or Graphics Tablet because it converts graphics and pictorial data into binary inputs. It is magnetic device used for input. A graphics tablet as digitizer is used for doing fine works for drawing and image manipulation application. A graphic tablet with styles is used for artistic work, like drawing, graphical image manipulation etc. Similarly, a graphic tablet with cursor is used for drafting work like engineering, drawing etc.

* **Track Ball:** → This is an input device that is mostly used in Note book or Laptop computer, instead of mouse. This is a ball which is half inserted and by moving fingures on ball, pointer can be moved.

* **Microphone:** → This is an input device to input sound that is then stored in digital form. The microphone is used for various applications like adding sound to a multimedia presentation or for mixing music.

* **Magnetic Ink Card Reader:** →
MICR is generally used in banks because of a large no. of cheques to be processed every day. The bank's code no. and cheque number are printed on the cheques with a special type of ink that contains particles of magnetic material that are machine readable. This reading process is called Magnetic Ink Character Recognition. The main advantage of MICR is that it is fast and less error prone. The main limitation of MICR is that it can recognize only 10 digits and 4 special characters. It cannot recognizes alphabetic characters and hence these can not be widely used.

* **OPTICAL MARK READER:** → It is a device that can detect the presence and absence of a pencil or Pen mark on a paper. Light is shown on to marked paper and reflected light is observed. The presence of mark is confirmed due to laser light being reflected from that portion of paper. This technique of mark recognition is possible only when preprinted cards or forms are used and the marks are made in specified portions or boxes on the document.
OMR is extremely useful for reading answer to questions in a test or survey. The questionnaires are designed accordingly with multiple choice entry. The student can select the appropriate box and fil it by soft pencils.

*** Output Devices :→

Output devices convert the computer processed data into human readable form. There are of two types :— (i) Softcopy output devices (ii) Hardcopy output devices.

** Softcopy Output devices : → These are the devices in which the information remains on display as so long as the power is on. When the power is switched off, the information is lost. The most common example of this device is visual Display Unit (VDU) i.e. Monitor.

* Monitor : → Monitor better known as Visual Display Unit are most commonly used output devices. The monitor accepts the images converted from digital to analog form and display them on screen. There are two types of monitors : → (i) CRT Monitors (ii) LCD Monitor.

CRT Monitor :→ CRT monitors use cathode ray tube for displaying images. their power consumption is very large as compared to LCD.

LCD Monitor : → LCD monitors use Liquid Crystal Displays. LCD monitores are widely used in Laptops and Note book etc. Their power consumption is very small as compare to CRT.

- Classification of monitors (Based on resolution) : →

① MDA (Monochrome Display Adapter) : → This device has single color i.e. black background and text in white. No Graphics can be displayed on it.

② CGA (Color Graphics Adapter) : → The CGA can have color capabilities with better resolution of text and graphics. The resolution is 320 X 200 in graphics mode.

③ HGA (Hercules Graphics Adapter) : → The resolution of HGA is same as compared to CGA. The resolution is 320 X 200, in graphics mode.

④ EGA (Enhanced Graphics Adapter) : → An advanced version of HGA. This has enhanced graphics capabilities. In graphics mode, the resolution is 640 X 350.

⑤ VGA (Video Graphics Adapter) : → In text mode, it provides a resolution of 720 X 400 pixels. In graphics mode, the resolution is either 640 X 480 (with 16 colors) or 320 X 200 (with 256 colors).

⑥ SVGA (Super VGA) : → It is an advanced version of VGA

⑦ 8514/A : → The 8514/A standard provides a resolution of 1024 X 768 pixels, that gives it about 2.5 times the pixels of VGA.

- Classification of Monitor (Based on color) : →

① Monochrome : → These monitor display only two colors, one for the background and one for foreground. The colors may be black and white, green & black or amber and black.

② Gray-Scale : → A grey-scale monitor is a type of monochrome monitor that is capable of displaying different shades of gray.

③ Colour : → All colour computer monitors are RGB (Red, Green, Blue) monitors.

* Classification of Monitors (Based on Signals): →

① Digital Monitor :→ A digital monitor accepts digits signals from the system. A digital monitor ~~displays~~ translates the digital signals into analog signals that control display. The digital monitors are fast and produce clear images.

② Analog Monitor: → The Analog monitor is the traditional type of color monitor that has been used for years in televisions.

** Hard Copy Output Devices: → These are devices in which the output remains permanently available. Output which is produced on a paper, is known as Hard-copy output. They are permanent in nature. Printers and Plotters are popular hardcopy output devices.

* Printers : → Printer is an output device, that produces hard copy of the output. When the output is obtained on paper it is called hardcopy. The printers can produce plain text, graphical images and some time complete pictures too.

* Types of Printers : → Impact Printer & Non-Impact Printer.

* Impact Printers: → Impact printers are those that strike on paper through inked ribbon to produce output on it. The various impact printers are as follows :— (A) Character Printers: — (i) Dot Matrix Printer (ii) Daisy wheel
(B) Line Printers: — (i) Drum Printers (ii) Chain Printer

(A) Character Printer: → These are slow speed which prints one character at a time.

(i) DMP : → Dot matrix printers forms characters by building them by dots. Each dot being produced by firing a wire pushing through solenoid at the inked ribbon, paper and plotter.

Advantage : →
1. Inexpensive since overhead and initial cost is low.
2. These are widely used due to low cost.
3. The characters of various languages can be printed.
4. Multiple copies can be produced using carbon paper.

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Disadvantage : →
1. Slow speed that is measured in characters per second
2. The quality of printing is very poor.
3. Produces a lot of noise.

(ii) Daisy Wheel Printer : → The head is lying on wheel and pins according to characters are like petals of Daisy, so it is called Daisy wheel Printer. A motor spins the wheel at a very fast speed. These printers have very slow speed of order of 10 to 50 characters per second.

Advantage : →
① The Quality of printing is better than DMP.
② The fonts of characters can easily be changed.
③ Multiple copies can be printed in a single print.

(5-ii - BIT) + 10-(i) - BIT

Disadvantages :→
1. They produce a lot of noise during printing.
2. The speed is slower than DMP's.
3. They are more costly than DMP's.

(B) Line Printer :→ As the name implies, such printers produce output from computers one line at a time.

(i) Drum/Barrel Printer :→ Drum Printers are fast in speed and speed is bet. 300 to 2,000 lines per minute.

Advantage :→
1. Very high speed, bet. 300 to 2000 lines per minute.
2. All features are available.
3. Multiple copies can be produced.

Disadvantage: →
1. It is very expensive.
2. The characters font can not be changed.
3. The strike should be very precise, since the mistiming cause wavy printing.
4. Make noise during printing.

(ii) Chain Printer :→ Chain printers use a rapidly rotating chain that is called print chain. The print chain contains characters. Each link of chain is character font. The speed lies in the range of 400-2400 lines per minute.

Advantages :→
1. The character fonts can easily be changed in chain printer.
2. The different language characters can be printed with same printer.
3. The printing is not wavy since the chain rotates horizontally,
4. Very high speed, bet. 400 to 2400 lines per minute.

Disadvantages :→
1. It produce a lot of noise during printing.
2. The timing of hammer strike is very critical.
3. They can not print any shape of characters or different size of prints.

** Non-Impact Printers :→ Those printers whose print heads do not strike to the paper to produce output are called non-impact printers. These printers use some other mechanism to print on paper. It can be spraying of ink, heating of paper, some electrical or optical methods for producing paper output. There are three types of Non-Impact printers are :-

1. Laser Printers :→ These are non-impact page printers. The laser printer uses a laser diode to write information on to drum coated with photo sensitive material. Laser printers are reliable printers and produce high quality printouts. The resolution of laser printers range from 300 dpi to 1600 dpi. The speed of laser printers ranges from 4-8 pages per minute.

Advantage :→
1. The quality of output is very high.
2. Very high speed, measured in pages per minute.
3. It gives good graphics quality.
4. It support many fonts and different character sizes.
5. Do not make noise while printing.

Disadvantage :→

1. Expensive
2. It cannot produce multiple copies of a document in a single printing.

2. Inkjet Printer :→ The print characters by spraying small drops of ink onto the paper. Special type of ink with high iron content is used. Each droplet is charged when it passes through the valve. Then it passes through a region having horizontal and vertical deflection plates. These plates deflect the ink drops to the desired spots on the paper to form the desired character.

Advantage :→

① Very less noise during printing.
② It is more reliable than DMP's.
③ The multiple colour printing is possible.
④ The quality of printing is very high.
⑤ No warm up time and lowest cost per page w.r.t other Non-Impact printers.

Disadvantage :→

① They are slow as compared to laser printers.
② They are expensive as cost per page is high as compared impact printer
③ The life time of inkjet prints produced is limited.
④ The narrow inkjet nozzles are prone to clogging with dried ink.

3. Thermal Printer :→ Thermal printers are printers that produce images by pushing electrically heated pins against special heat-sensitive paper. Thermal printers are not costly and are used in calculators and fax machine. They produce low quality print and the paper tends to curl and fade after a few weeks or months.

*** Plotters :→ A plotter is an output device used to produce hard copies of graphs and designs. They use ink pen and inkjet to draw graphics and drawing. Pens could be monochrome or multicoloured. Plotters are slow devices because a lot of mechanical movement is required during plotting. The graphics and designs produced by pen plotters are uniform and precise and are of very good quality. There are three types of plotters :—

① Drum Plotter :→ It consist of a drum on which the paper can be mounted. There are one or more pen holders fixed horizontally across the drum in which the pens are clamped. The drum rotates back and forth to produce vertical motion. The pens can move to produce horizontal motion. As the drum and the pens move simultaneously designs and graphs are plotted on the paper. The method can be used to get multi-coloured designs by using pens of different colours. These are least expensive plotters.

2. Flatbed Plotter :→ In flatbed plotters, the paper on which plotting is to be done is fixed on a flatbed which is the rectangular top of table. Thus in this type of plotter, paper does not move but only the pens can moves in all directions. Flatbed plotters are more expensive.

3. Electrostatic Plotter: → These are electrostatic charged to create image out of very small dots on specially treated paper. The paper is run through a developer to allow the image to appear. These are faster than pen plotters and can produce images of very high resolution.

*** OPERATING SYSTEM : →

An operating system (OS) is an organised collection of s/w modules that provide an effective interface bet. the computer users and the computer resources. The computer resources like CPU, Main Memory, I/O devices, secondary storage devices, files and Network etc.

* Characteristics :→

1. It makes the use of computer convenient and in an efficient manner.
2. It can be viewed as a resource allocator.
3. It manages the computer resources efficiently.
4. It provides a mean to the user to execute programs.
5. It controls and co-ordinates the use of h/w among various programs i.e. it can be viewed as a control program.

* Functions : →

1. Memory Management :→ The following memory management fns are performed by O.S. —
   (a) It keeps track of which primary memory segment is in use and by whom and what part of it is not in use.
   (b) It decides which process will be loaded into memory, when and for how much time.
   (c) Allocates the memory when requested by the process.
   (d) Deallocation of the memory when the process no longer needs it or has been terminated.
   (e) Swapping of processes from and into the memory.
2. Process Management : → The following process management functions are performed by O.S :—
   (a) It keep tracks of process and the status of process i.e. process is in suspended, waiting or needs to be terminated.
   (b) It decides which process gets the processor, when for how much time, called process scheduling.
   (c) Allocate the processor (CPU) to a process.
   (d) Deallocate the processor when processor is no longer required by process.
   (e) It provides mechanism for inter-process communication.
   (f) It provides mechanism for process synchronization for sharing of resources.
   (g) It provides mechanism for handling the deadlocks.

3. I/o Management :—>

The following device management functions are performed by OS:-

(a) It keeps tracks of all devices, by using device drivers that facilitate I/o functions.

(b) It also decides which process gets the device, when and for how much time.

(c) It allocates the device efficiently.

(d) It deallocates the device when not required.

4. File Management :—>

The following file management functions are performed by OS :-

(a) It keeps track of file information, its location, user status etc.

(b) Creats and deletes files.

(c) Creats and deletes directories.

(d) It maps files onto secondary storage.

(e) Takes back-up of files onto secondary storage devices.

(f) It provides support for manipulating files and directories.

5. Protection :—>

The following protection functions are performed by OS.

(a) It provides means to distinguish bet. authorized and unauthorized usage.

(b) It ensures that the files, memory segment, CPU and other resources can be operated on by only those process that have gained proper authorization from it.

6. User Interface :—> A system program, called command interpreter acts as an interface bet. user and operating system. The processing of user commands to create computational structures and access resources is performed by OS.

7. Communication Management :—>

The following functions are performed by OS to manage communication

(a) It provides the user of access to various shared resources that the system maintains.

(b) It generalize network access as a form of file access with details of networking being contained in the network Interface's devices driver.

*** Operating System Services :—>

1. Program Execution :—> The purpose of a computer system to allow the user to execute programs. So, the OS provides an environment where the user can easily run program.

2. I/o Operation :→ The os hides from the user the details of underlying hardware for the I/o. All the user sees is that the I/o has been performed. So the operating system provides I/o and make it convenient for the user to run programs.

3. File System Manipulation :→ The output of a program may need to be written into new files or input taken from some files. The os provide this service.

4. Communication :→ By providing this service, the os relieves the user of the worry of passing message bet processes. In case where the messages need to be passed to processes on the other computers through a network, it can be done by user programs.

5. Error Detection :→ The os constantly monitors the system for detecting error. This relieves the user of worry of errors propagating to various part of system and cause malfunctioning.

6. Resource Allocation :→ When there are multiple users or multiple jobs are executing at the same time, then resources must be allocated to each of them. These different resources are managed by the operating system.

7. Accounting :→ The operating system provides the facilities to keep track of which users use how much and what kind of computer resources.

8. Security :→ The security starts with each user having to authenticate himself to the system generally by means of a password, to be allowed access to the resources.

** Operating System as Resource Manager :→

An operating system is basically a resource manager and major resource it manage is the h/w of computer system. An Operating system act as a virtual machine standing between our programs and h/w and provides a more convenient machine to the users to operate. The key resources managed by operating system are:- Processes and Processors, main and secondary memory, Data and Info. stored in files, Job scheduling and monitoring.

While managing these resources, the os is mainly concerned with the issues like efficiency, protection, security, privacy, reliability etc. The different component of os performs different functions to manage the resources.

The various components of OS and their main function is as follows :→

① The Processor Manager — is responsible for assigning computation time or processor time.

② The Job Manager – is responsible for reading in your program, determining the resource needs, ensuring that these resources are available, scheduling the job for execution, monitoring the job throughout execution and releasing the resources, when not needed or the job terminates.

③ The Memory Manager :— is responsible for assigning memory and releasing memory as the job completes.

④ The I/O Manager :— is responsible for assigning and performing all I/O operations to specific devices.

⑤ The Info. Manager :— handle requests for filling an auxiliary storage, with a specific group of data items under an assigned file name when the data items are needed, the info. manager finds the file and gives the location to I/O manager.

⑥ The Command Interpreter :— interfaces with the computer operators, Application and system programers, programs, h/w and other naive users.

** Types of Operating System :—

Single user O.S	Multiuser O.S
1. Only one user can use it at a time.	1. Many users can use it at time.
2. It is a stand alone system.	2. Many systems are connected with one another.
3. It is more secured.	3. It is less secured than the single use O.S.
4. Sharing of data is not possible.	4. Sharing of data is very easy.
5. It is interactive in nature.	5. Less interactive than single user O.S.
6. It is very simple.	6. It is more complex.
7. It is quite cheap.	7. It is quite expensive.
8. The functions are very less.	8. There are more functions in multiuseros.
9. Its size is small.	9. Its size is very large.
10. Examples are - Dos, Windows.	10. Examples are window NT, Unix.

* Classification of operating System :→

① Batch processing O.S :→ Batch processing required that a program its related data and relevant control commands should be submitted together in the form of a job. Batch O.S allow no interaction bet the users and executing programs.

Thus, the programs that have long execution times and require little operator interaction during execution, are well served by batch processing

* Disadvantage :→

① The lack of interaction bet the user and job while job is executing.
② The CPU remains idle generally.
③ Difficult to provide the desired priority.
④ The turnaround time is high. The turnaround time is the delay bet the job submission and job completion.

(2) Interactive O.S :→

An interactive system provides on-line communication bet. the user and the system. The user gives instruction to the O.S. and receives an immediate response. When the O.S finishes the execution of one instruction it seeks the next instruction from the user keyboard. Applications of Interactive or on-line O.S :- Electricity and Gas boards, Banking, Tour operators, stock exchange, stock control.

(3) Realtime O.S :→

Realtime system is defined as a data processing system in which the time interval required to process and respond to inputs is very small. Real time processing is always on-line, whereas on line system need not be real time. The real time systems are used in environments, where a large no. of events, mostly external to the computer system, must be accepted and processed in a highly time bound manner. The primary objective of a realtime system is to provide quick response to external events, so as to meet the specified deadlines of processing. Applications :→ Air traffic control system, process control system used by thermal power plants for boilers, process control system as in nuclear reactor plants etc.

(4) Multiprogramming OS :→

A multi-programming system permits multiple programs to be loaded into the memory and execute the programs concurrently. A program in execution is called 'Proces' or a 'Task'. The concurrent execution of programs has a significant potential for improving the utilization of system resources and thus enhancing the system through out, as compared to batch and serial processing. Advantage:→

① Increased throughput.
② Shorter response Time.
③ Ability to Assign priorities to jobs.
④ Improved primary storage Allocation.

(5) Time Sharing System :→

Timesharing system allow many people, to use a particular computer system at the same time. Each user has its own set of programs and specific time slices are allocated to different users in rotation. Timesharing sharing may be viewed as a multiuser programming system.

Advantage :— 1. It provides quick response.
2. It avoids duplication of s/w.
3. It reduces the output of paper.
4. It significantly increases CPU utilisation by switching from one program to another in rapid succession.

Disadvantages :—
1. It is not fully reliably.
2. Data communication bet. processes is a problem.
3. The security and integrity of user program and data is another area.
4. The overhead involved in switching of process is quite significant.

(6) Multiprocessing :→

This system consist of two or more CPUs connected to common peripherals. Instruction from different programs may either be processed by different CPUs or one processors may execute instructions from the same program simultaneously. This system is generally used ~~in large no. jobs need to be performed simultaneously~~, in large computer installation, where jobs are too large to handle for one CPU or where a large no. of jobs needs to be performed simultaneously.

Advantages :→
1. It improves the performance of computer system by allowing parallel processing of programs.
2. It provides a built in back up.
3. It utilize the CPU and other devices very efficiently.

Disadvantages :→
① It require large main memory.
② These systems are very costly.

(7) Multitasking OS → In multitasking several programs resides in main memory and are executed simultaneously. In multitasking, the computer might be printing out a data file while at the same time the user is running a word processing program.

The goal of multitasking is to allow devices to perform much of their own processing independent of CPU. Multitasking system divide the screen into a series of window. A window environment have provisions for moving data bet. windows, allow programs to exchange info.

For example, the program in window 1 could be printing a document and program in window 2 could be transmitting a document to another via modem.

(8) Distributed OS :→ A distributed OS serve in distributed enviroment, where a collection of computer system, capable of communicating and cooperating with each other through network, are connected to each other through a LAN/WAN.

Key objectives of Distributed O.S. is transparency i.e. resource distribution must be hidden from the users and application programs. The distributed O.S. provides means for system-wide sharing of resources like computational capacity, I/o and files etc.

Advantage :→

① The risk of system breakdown is very small.
② It provides better service to the customers.
③ The delay in data processing reduces.
④ The system response time is fast.
⑤ The system availability is high.

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— Unit-2 —

Q. What is network ? What are the component of a computer network. Explain its advantages.

Ans — A network is a group of computers, printers and other devices that are connected and communicate with each other. The media used in networking can be copper wire, fiber optics or radio waves. There are three types of network — LAN, MAN & WAN.

- **Components :→**

1. Servers :→ Computer that provide shared resources to network user.
2. Clients :→ Computer that access shared network resources provided by a server,
3. Media : → The wire that make physical connections.
4. Shared data :→ Files provided to clients by servers across the network.
5. Shared printers and other peripherals → Additional resources provided by server.
6. Resources : → Any service or device, such as files, printers or other items made available for use by members of the network.

- **Advantages :→**

A computer network allow people to share the resources such as hardware e.g. a laser printer and information. Following are the advantages of computer network.

1. Reduced cost :→ Since resources can be shared, it greatly reduces the costs.
2. Fast communication :→ With networks, it is possible to exchange the info at very fast speed.
3. Networks are productivity tools.

- **Disadvantages :→**

1. Fear of loss or theft of data :→ An unauthorised employee / user can damage important data or make a copy of secret info & pass it to the competitor.
2. Maintenance :→ For proper working of a network it needs some maintenance task to be performed periodically, usually on a weekly basis. It increases the overhead.

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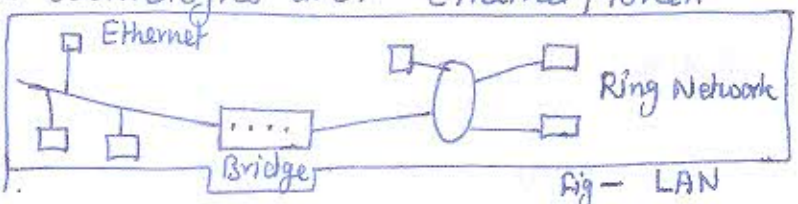
Q. What is LAN.? What are important characteristics of LAN. Name at least three technologies.

Ans— A LAN is a data communication networks, which connects many computer or workstations and permits exchange of data and info. among them, within localized area, typically confined to a building or a cluster of buildings. The distance between two communication points connection is usually upto 02-05 kilometers.

Characteristics: →

1. Area covered is small.
2. Each device connected in the network can either operate stand-alone or in the network.
3. Data transfer rates are high, usually 1 Mbps – 100 Mbps.
4. Each device connected in the network can communicate with any other device in the network.
5. Cost of setting up network is usually low.

The main LAN technologies are:— Ethernet, Token Ring and ARCNET.



Fig— LAN

Advantages of LAN: →

1. LAN is a productivity tool.
2. LAN allow for high-speed exchange of essential info. bet. key people in an organisation.
3. LAN allow sharing of expensive resources such as laser printers and high capacity, high speed mass storage devices among no. of users.

Limitation: →

1. This reduces the memory space available for user's programs.
2. The financial cost of LAN is still high.

Q. What is MAN?

Ans— A metropolitan Area Network covers larger geographic areas such as cities or districts. By interconnecting smaller networks within a large geographic area, info. is easily spread throughout the network. Local libraries and government agencies often use a MAN to connect to citizens and private industries. The geographical limit of a MAN covers a city.

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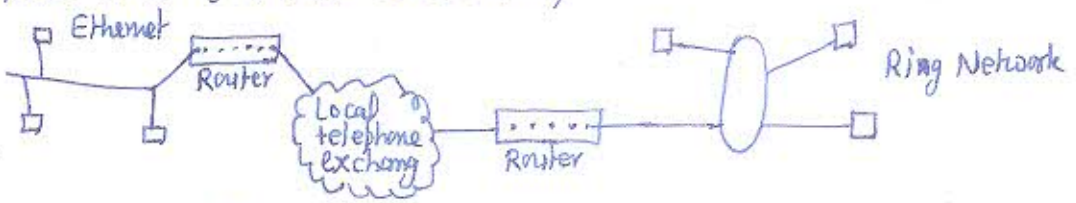

Fig— MAN

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Q. What is WAN ? Explain its types ?

Ans— Wide Area Network connect larger geographic areas such as India or world. A WAN may be defined as data communications networks that covers a relatively broad geographic area to connect LAN's together bet. different cities with the help of transmission facilities provided by common carriers such as telephone companies.

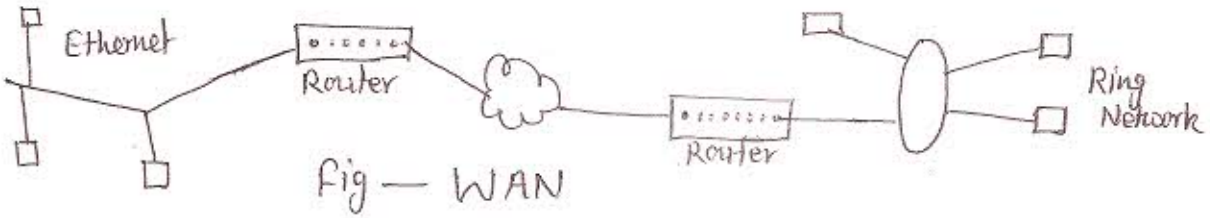


Fig — WAN

- Types: →

1. Public Networks: → These are the networks that are installed and run by the telecommunication authorities and are made available to any orgn. or individual who go in for their subscription.
2. Private Networks: → The basic technique used in all forms of private WAN is to use private circuits to link the locations to be served by the networks.

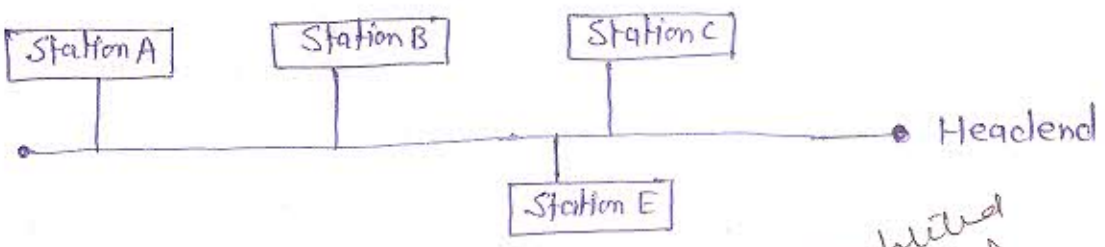
*** Network Topology :→

Topology is physical arrangement for connecting computers. Selection of topology is based on following:—

1) Flexible to accomodate.
2) Minimum cost of physical media.
3) Cable type.

** Types of Topology :→

(1) Bus Topology :→ In bus topology, single transmission medium interconnects all the stations. All stations share this medium for transmission to any other station. Every station listen to all the transmission on the bus. Every transmission has source and destination address so that stations can pick the message meant for them & identify their senders.



Bus Topology

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Advantage of Bus Topology :→

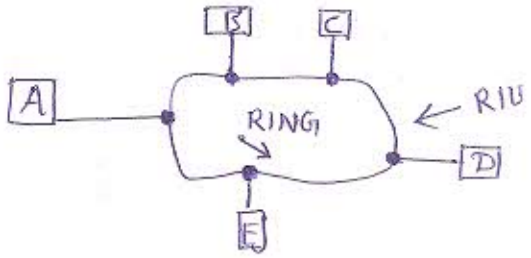
1. The amount of media is used is very small.
2. The new stations are added by tapping working bus very easily.
3. The coverage can be increased by extending the bus using repeaters.
4. The stations are connected to the bus using a passive tap.

Disadvantage of Bus Topology : →

1. Terminators are required at both ends of the backbone cable.
2. The nodes must be intelligent.
3. The fault isolation is difficult, if the entire network shut down.
4. Entire network shut down if there is a break in the main cable.

(2) Ring Topology :→

A ring network consist of a number of transmission links joined together in form of a ring through repeaters called Ring Interface Unit (RIU). The transmission is usually unidirectional on the ring. Thus, each repeater receives the signals at its input and after regeneration, send it to the repeater of next station. If the frame belongs to the station, a copy of incoming frame is retained. Each frame contains source and destination addresses.



Ring Topology

Advantage :→

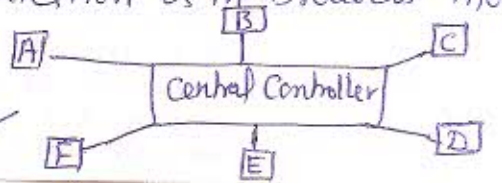
The amount of cable involved in a ring topology is small. This means that less connections will be needed, which will in turn increase network reliability.

Disadvantage :→

If one node fails to pass data through itself, the entire network has failed and no traffic can flow until the defective node has been removed from the ring.

(3) Star Topology :→

A star network consist of dedicated links from stations to the central controller. Each interconnection supports two-way communication. The central controller acts a switch to route the frames from source to the destination unlike ring or bus topologies where communication is in broadcast mode.



Star Topology

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Advantage :→ The fact that central node is connected directly to every other node in the network means that faults are easily detected and isolated. It is simple to disconnect failing nodes from the system.

Disadvantage :→ If the central node in a ustar network fails, the entire network is failed.

(4) Tree Topology :→ A tree topology combines the bus topology and ustar topology. It consist of groups of ustar configured connected to a bus backbone cable. Tree topology is flexible and allow expansion of existing network with ease.

Advantage :→ Any h/w/s/w vendors have support for it.

Disadvantage :→ Tree topology is more difficult to wire and configure than other topologies. Breakage of backbone line make the entire segment down.

(5) Mesh Topology :→ A network topology featuring a direct path bet. two nodes.

Advantage :→ Mesh topologies are easy to troubleshoot because each medium link is independent of all other. You can easily identify faults and can isolate the affected link.

Disadvantage :→ Mesh networks are relatively difficult to install because each device must be linked directly to all other devices.

(6) Hybrid Topology :→ A combination of two or more network topologies. The resultant is a hybrid network. The backbone is mostly a mesh network, each local loop is a ustar network with central office at each hub.

Advantages :→ (i) Ease of expansion.
(ii) Ease of fault diagnosis and isolation by the presence of concentration point and wiring it into the ring.
(iii) Ease of cabling.

*** Network Devices :→

(1) Repeater :→ A repeater is a physical layer device used to interconnect the media segment of an extended network. A repeater enables a series of cable segment to be treated as single cable. Repeater receive the signal from one network segment and amplify and retransmit those signals to another network segment. These actions prevent signal deterioration caused by long cable length and large no. of connected device. Repeater regenerate the weakend data signal back to its original strength.

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(2) HUB :→ A hub is designed to hold multiple line cards each with multiple inputs. All lines comming into a hub must operate at the same speed. Hubs are of three types —

① Passive Hub :→ They simply take all of packets they receive on a single port and re-broadcast them across all ports.

② Active Hub :→ Active hub has additional features of actually watching the data being sent out. If the signal received by an active hub is weak but still readable,

③ Intelligent Hub :→ Intelligent hub into you network infrastructure give the ability to manage your network from one central location. If the problem develops with any device on a network connected to an intelligent hub, it can easily identify, diagnose the problem using the management info. provided by each intelligent hub.

(3) Bridges :→ Bridges are simple device that connects LANs that use the exact same network architecture. Bridges, on the other hand, only pass on message that are for nodes on other LANs. It does this 'filtering' by maintaining a list of device addresses that are assigned to the network interface cards attached to the network.

- Local Bridges :→ provide a direct connection bet. multiple LAN segments in the same area.
- Remote Bridges :→ Connect multiple LAN segment in different areas, usually over tele communication lines.

Advantage :→

① It handles all protocols.
② Very less staff needed.
③ It uses automatic path optimisation.
④ It provides more flexibility.
⑤ It provides simpler installation and configuration.

(4) Routers :→ Routers are the devices provide connectivity bet. two LANs and two WANs over large geographical distances. Router choose the best route to send a message, when several possible routes exist in a complex network topology. It does this by maintaining a routing table to identify the path. The routing table contains addresses. These addresses differ from the address used by bridges that look LANs together. They are called internetwork addresses. Routing is the process of sending message through switches such that they reach their destination in an efficient way.

Completed

18/02/11

Comp. Mgt

Advantage of routing :→

① It provides simpler administration of network security.
② It complements bridging in large network.
③ It is useful for lower speed WAN links.

(5) Gateway :→ A gateway make it possible for an application program, running on system, confirming to network architecture to communicate with an application program running on a system confirming to some other network architecture. The function of gateway is to convert one set of communication protocols to some other set of communication protocols.

(6) Switches :→ Switches can send and receive information at the same time, so they can send information faster than hub can. Switches cost a little more than hubs.

** Network Connections :→

(i) Physical connection :— The physical connection allow computers to directly transmit and receive signals from other computers. Physical connections are defined by medium used to carry the signal, the geometric arrangement of computers i.e. topology of network.

(ii) Logical connection :— Logical connections / virtual connections allow the computer applications like word processor, database to exchange info. with other computers. The logical connections are created by network protocols. These network protocols allow sharing of data bet. applications on different types of computers in a network.

** Wireless Networking :→ is a technology that enables the cabling that connect each computer to the network to be replaced by a specially coded wireless signal.

* Component of Wireless Networking :→

① Wireless Network cards :— Every computer that required to be connected to the network needs a network cards to be installed on it.

② Wireless Access Point :— It acts as an alternative to the hub in wireless networks. When it is on, it will be the point of communication for the wirless card in each of the computer that are configured to connect to it.

21/2/11 Completed

(3) Wireless Broadband Routers
(4) Wireless Bridges

* Applications of Wireless Networking :→

① Business owners or IT directors who need flexibility use wireless n/w.
② Universities, colleges, IT professionals or business executives who want mobility use the wireless networking.
③ Any company whose site is not suitable for network wiring because of building or finance limitations like older buildings, temporary sites or leased space.
④ Travellers who need access to email and the Internet while on the road.
⑤ Small business owners or home users who have a need to share across a group of users.

* Advantages of Wireless Networks :→

① A user is always connected with no wires and full mobility.
② Users are able to do anything they can do with a fixed network.
③ Wireless networking open up new ways of working like working in groups for off-site teams and for mobile workers.

* Limitations / Disadvantages of Wireless Networking :→

① Inadequate reliability :→ The wireless networks are not reliable as wired ones.
② Inadequate Security :→ The wireless networks are not as much secure as wired ones.
③ High Cost :→ The cost of installing and maintaining the wireless networks is high
④ Lack of awareness :→ The people dont know about the wireless networks and how they can be properly used
⑤ Lack of voice capability :→ There is a lack of voice capability in the wireless networks.

** Firewalls :→ A firewall is a software program or h/w device that filters the inbound and outbound traffic bet. user network or computer and the Internet.

completed

22/2/11

23/02/11

Firewalls can help the user in protecting the data and computer by preventing (blocking) –

① Traffic from known malicious computers.
② Unauthorized traffic / viruses coming into user's computer or network.
③ Specific traffic that user do not want leave the computer / network.
④ Attacks on the computer and attempts to access data.

Firewall allow all traffic through it that meets certain criteria.

* Types of firewall :→

① Packet Filtering firewalls :→ These firewall works at Network layer of OSI model or IP layer of TCP/IP model. These are the part of the router. The packet filtering firewall compare each packet with a set of criteria before forwarding them. The firewall can drop the packet, forward it to the network or send a message to the originator, depending on the outcome of the comparision of packet and the criteria.

Advantage :— ① Low cost and low impact on Network performance
② Most routers support packet filtering.

② Circuit level Gateways :→ These type of firewall work at the session layer of OSI model or TCP layer of the TCP/IP model. These firewall monitor the TCP handshaking bet. packets to determine whether a requested session is legal. The info. passed to the remote computer through circuit level gateways appears to have originated from the gateway. This type of firewall is useful for hiding information about protected networks.

Advantage :— ① They are relatively inexpensive
② They hide the info. about the private network they protect.

Disadvantage :— ① They don't filter individual packets

③ Application Level Gateways :→ These firewalls work at the application layer of OSI or TCP/IP model. They are similar to the circuit level gateways except that they are application specific. The packet can not access services for which there is no proxy. These can also used to log user activity and logins.

Completed

3/3/11

Advantage :→

1) They offer a high level of security.
2) They can filter application specific commands like http:port/get
3) They can log user activity and logins.

Disadvantage :→

1.) They have significant impact on network performance, since context switches slow down network access.
2) They are not transparent to end users.
3) They require manual configuration of each client machine.

(4) Stateful Multilayer Inspection Firewalls:→

This firewall a combination of all the three previous firewalls. These firewalls filter packet at the network layer, determine whether session packets are legal and evaluate the content of packets at the application layer. These firewalls allow a direct connection bet. client and host. They depend on the algo. to recognize and process application layer data instead of running application specific proxies.

Advantages :→

① They provide a high level of security, good performance and transparency to end users.

Disadvantage :→

① They are expensive.
② They are less secure than other type if not administered by competent personnel.

- Benefits of Firewall Security :→

① It allow Network administrator to offer access to specific types of Internet service to various LAN users.
③ Privileges on Internet services can be granted acc. to job description and need.

- Limitation of Firewalls :→

① Firewall constitute a traffic bottleneck.
② They concentrate security in one point that cause the single point of failure.
③ They degrade network performance.
④ The cost of managing firewall rules is very high.

completed

4/3/11

** Viruses :→

A computer Virus can be defined as mad made program that can attach itself to another normal program or file. When this file or program travels to other computer, it spreads the infection.

A computer virus is a tiny program that spread from one computer to another computer and that infects computers and either disturb the operations of a computer or make them unusable. A computer virus may corrupt or delete data on a computer, use an email program to spread the virus to other computer or even delete everything on the harddisk.

* Types of Viruses :→

① Network Virus :→ Network viruses quickly spread through a LAN and sometimes throughout the Internet. The most dangerous virus are Nimda and SQL Slammer.

② Logic Bomb :→ The logic bomb virus is a piece of code that is embeded into a s/w system. When this virus is activated, various activities takes place such as files are permanently deleted or renamed.

③ Boot Viruses :→ These viruses infect master boot records (MBR) in hard disk or floppy disk's boot records. They replace the boot record program by overwriting it or copying it any where else on the disk. Examples are - Stone, Disk killer, Michelangle

④ Program Viruses :→ These viruses infect the executable files, having extension .Exe, .Com, .Obj, .BIN, etc. These viruses become active when the program file carrying the virus is opened. eg. Comcade, Sunday

⑤ Multipartite Viruses :→ The multipartite virus is a hybrid virus. It has the properties of boot and program viruses. The multipartite viruses first infect the program files and when these infected programs are executed, they infect the record boot. When the system is booted again, the viruses from the boot record loads in memory and then start, infecting other files on disk. e.g. Tequila, Invader and Flip.

⑥ Stealth Viruses :→ These viruses alter its file size in directory listing e.g. Brain, Johshi, & Frodo, Whale.

⑦ Macro Viruses :→ A macro virus is programmed as a macro embeded in a document. The macro virus is activated and infects the normal template. When a word processing or spread sheet is opened. Once a macro virus gets on to the computer, every document the user produce will become infected. e.g. Word Concept, Nuclear, DMV.

Completed 4/03/11

(12-BIT)

Unit-3

5/3/11 add

** **Internet** :→ Internet is a networks of millions of computer networks connected by communicational channel. OR

The internet is also defined as a network of networks that are physically interconnected, communicate and share data with each other and act as a single network.

* **Requirement of Internet** :→ A user needs the following to access the internet :→
  1. Computer.
  2. A modem connected with a telephone line.
  3. An internet access account from an ISP.
  4. Software to access the information and connecting to internet.

* **Use of Internet** :→
  1. Sending, receiving and distribution of email message to individuals and groups of individuals related to business organisation.
  2. Storage and retrieval of information by maintaing web pages and use of the search engines.

* **Advantage of Internet** :→
  1. **E-mail** — Email is an essential communicational tools in business. It is also an excellent way for keeping touch with family and friends. The advantages of e-mail is that it is free and fast as compared to telephone, fax and postal services.
  2. **Global Audience** :→ Content published on world wide web is immediately available to global audience of users. This makes the world wide web ~~(is immediately available to a global audience of user)~~ a very cost effective medium to publish information.
  3. **Multimedia** :→ The capability in incorporated multimedia into webpage is a major advantage of using world wide web to publish information. For exsmple, many website use sounds and video clips to make the content easier and more intresting to browse.
  4. **Communication** :→ We can communicate in a fraction of second with a person who is sitting in the other part world using internet.
  5. **Information** :→ There is huge amount of information available on the internet. The search engine like Google, yahoo is at our service on the internet.
  6. **Services** :→ Many services are provided on the Internet such as online banking, job seeking, hotel reservation etc.
  7. Ecommerce (8) Entertainment (9) Provide technical support (10) Product Advertising

completed add

5/3/11

** Disadvantage of Internet :→ 7/10/11

① Theft of Personal Information
② Spamming (sending unwanted emails in bulk)
③ Internet Addiction (habitual)
④ Negative effect on family communication
⑤ Virus Threat
⑥ Children using the internet
⑦ Pornography

** Applications of Internet :→

① WWW :→ WWW is a system that provides all kinds of information on the internet. It is very popular because it is colorful, rich in content (text, audio, video) and easy to use. Two major use of WWW are
(i) e-commerce – that provides online auctions, retailing, travel services etc.
(ii) entertainment – that provides facility of listening music and playing games online.
The multimedia adds graphics, video and audio in WWW with text.

② E-mail :→ Email is the most commonly used application of internet. It means sending and receiving message by computer on the internet. The major advantage of e-mail are it is cheap, easy to use, save time, save paper and delivery of message is confirmed immediately.

③ FTP :→ FTP is a tool that allow files to be transferred from host computer to another computer on the internet. FTP is a method whereby one can connect to a remote computer, called FTP site & transfer files to its own computer's hard disk. Two types of file transfer is possible – (i) when the file is transferred from host computer to your computer, it is called downloading (ii) when the file is transferred from one's computer to host computer, it is called uploading

④ Newsgroup :→ News group is a system of discussion about a specific subject. It is helpful for online typed discussions on specific topics. Newsgroup takes place on a special network of computers known as USENET, a worldwide network of servers that can be accessed through internet. For participation in usenet, one requires a newsreader, a program included with most browser that allow to access a newsgroup and read & type message.

completed

13/11

8th March, 11 (4)

5. Telnet :→ Telnet is a program or command that enables a user to connect to remote computers on the internet using a username and a password. Telnet is the internet service that allows you to log into a remote internet computer. Telnet is useful for in using large database at universities, government agencies or libraries.

6. Mailing Lists : → Mailing list provide an opportunity to keep up with the development in a specific field of interest with minimum effort & cost besides allowing you to share your knowledge with other subscribers. To join the mailing list, you can send an email that includes your own e-mail address to the mailing list server. Mailing list works in two ways. First a message is sent to a single e-mail address, which is called as mailing list server address. Second, this message is then re-sent to all other subscribers to the mailing list.

7. Wide Area Information Service (WAIS) : →

This maintains separate indexes of contents of selected documents e.g. indexes available at rear of the book. It can choose any index & WAIS respond by providing a list of documents in that index. WAIS also allow to read there documents. It is full text search system. It has ability of searching in more than one database simultaneously.

8. Internet Relay chat : →

It is a system that enables user at other internet folks to talk to each other in a real time mode. It is a party line over which you can ~~have~~ chat on interesting topic with other users at same time.

9. Video Conferencing : → Video-conferencing is sending your image and voice to one or more other people through microphone & camera attached to your computer & receiving pictures & video back. In video conferencing system, a computer digitises sound and video images, that converts them to analog signals & transmits them over the telephone lines to the receiver's computer, which reconverts analog signals to digital signals.

Completed

8/3/11

9/03/11

10. Audio-Conferencing :→ It is the use of voice communication equipment to establish an audio link bet. geographically dispersed persons for conducting a conference. Telephone conversation was the first form of audio-conferencing. It does not require a computer. Audio conferencing is best suited to that are spread over a wide area. During audio-conferencing, a copy of conference agenda should be made available to participants in advance & when participants speak, they should identify themselves. The no. of participants in audio-conferencing should be kept to a manageable size.

E-mail (Electronic Mail)

E-mail is sending and receiving message by computer on the internet. E-mail is the most widely used service on the internet. Most of offices are sending their mails through computer. E-mail is also the basis of much organised exchange of information bet. groups of individuals.

- **Advantages :→**
  - (i) High speed
  - (ii) Easy to use
  - (iii) Cost effective
  - (iv) Time saving
  - (v) Flexible
  - (vi) Wastage reduction
  - (vii) Message storing
  - (viii) Record Maintenance

- **Limitation of E-mail**
  - (i) Fast Medium – If wrong data has sent to recipient, but it is too late.
  - (ii) Hardware Requirement :→
  - (iii) Lack of expertions.

- **E-mail Account :→** The following are the popular web sites which allow you to open an e-mail account.
  - Yahoo – http://www.mail.yahoo.com
  - Hotmail – http://www.hotmail.com
  - Rediff – http://www.rediff.com
  - Google – http://www.gmail.com

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- **Structure of a Mail Message :→**

An email message is structured very much similar to a letter on paper. An e-mail is divided in three parts, header, body and signature. The header, at the top of message, is the envelope, the body is the actual message, the signature comes at the last.

To : Mail id of recipients (s).

Date: Date on which message was sent.

Subject: Subject (Title) of e-mail message.

From : The person who sent the message

Cc : Mail-ids of people who were mailed carbon copy of e-mail

Bcc : Blank carbon copy.

(3) **Chatting :→**

Chatting is a form of communication on the Internet which allows you to talk with friends and family members.

IRC (Internet Relay Chat) is a kind of chatting service of internet, which is provided by channels live on many IRC servers. IRC is a client/server network, where a user can logon to a chat server using IRC client software such as MIRC. After logging on to a chat server, the user has to select a channel on which he/she wants to chat. The command/message typed by the user is sent to IRC server by IRC client software.

Instant messaging is like having a real-time conversion with another person or a group of people. When you start chatting on the Internet, a chat session starts. The chat session takes place in virtual room/place called chat room. Each and every chat room has a list of categories of topics, in which you can select a category of your choice.

When you type and send an instant message, the message is immediately visible to all participants. All participants have to be online and in front of their computers at the same time. Communicating by means of instant messaging is called chatting.

To start a chat session, you need to connect to the Internet and use a chat program such as Yahoo Messenger, Google talk or rediffbol. You can download chat programs from different chat websites. Some of the popular that facilitate you to start chatting on the Internet are:— http://www.talkcity.com, http://www.yahoo.com, http://www.sify.com, http://www.msn.co.in, http://www.indiatimes.com.

Applications of Computers :→

* Computer Application in Healthcare :→

In health care, computers are widely used. In Incentive Care Unit (ICU), computers are used to monitor patients' conditions. A computer can also perform pathological test. From a single sample of a blood of a person, the computer can provide status of hemoglobin, sodium, potassium, calcium, phosphorus, uric acid, albumin, protein, WBC (white blood cells) and RBC (Red blood cell) count etc.

Computers are widely used in hospitals to support doctors in diagnosis and getting information on patients, diseases, treatments drugs etc. Computers can be used to diagnoses the patient. Information on the condition of patients, details of tests and clinical report may be stored on a computer system that can be used to provide ward & patient summary reports.

* Applications of computer in Offices :→

In offices, computers are used :

- In preparation of letters & reports.
- to keep record of employee.
- for publicity & administrative.
- for advertisement.
- to handle correspondence & office communication.
- to prepare & store files.
- In accounting, billing, preparation of pay roles etc.
- In data analysis.

* Application of Computers in Banks :→

Computer are used in banks to

- make entry in passbooks.
- to make withdrawls & deposits.
- issue fixed deposit receipts.
- to provide online service to its customers.
- to maintain ledger & handle transactions.
- to take out money from ATM (Automated Teller Machines)

Completed on 11/3/11

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* Applications of Computers in Educational Institutes :→

Computers can be seen everywhere in educational institutions. These can be seen in classroom, laboratories, libraries, museums etc., computers have lot of applications in education, few of which are as follows :—

- Computers help the students in preparing their presentations, project reports & even the notes.
- Computer can repeat the material of the presentation as many times as desired.
- Computer graphics helps the students to visualize three-dimensional figures & graph from different angles to understand the concept in a better way. Picture can move, rotate or computer can even speak.
- In libraries, student can enter the name of book that he wants to read & the contents of books appears on screen. Now-a-day, concept of paperless libraries comes into existence.
- In museums, computer helps in giving information by telling about the exhibits.
- In educational institutions, computers are also used by teachers, for teaching, testing, to make the students understand in a better way according to their mental level and caliber.

* Applications of computers in Medicines :→

In medical field, computer have lot of applications :—

- for diagnosis of illness of patient.
- for performing surgeries.
- for getting information of treatments and latest drugs.
- to keep record of patients.
- in Ultrasound, Magnetic Resonance Imaging, CT scan etc.
- to perform pathological tests.
- to replace defective organs inside the body.
- to take internal photographs of human body without even putting a cut on human body.

Completed ✓ 12/3/12

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* Applications of computers for Ticket Reservation at Railway stations & Airlines :→

- Computer gives all necessary information regarding ticket reservation i.e. train or flight numbers
- It also gives information regarding name of passengers, their age, destination, date of journey etc.
- Also provide information about the seats in hotels in far away areas & their climate for convenience of travellers.

* Applications of computer in Science :→

- Without help of computers, scientists can not provide any info. about our solar system.
- Scientist can predict volcanoes, earthquakes, hurricanes etc. & warn people so that safety measures can be provided well in time.
- for weather forcasting.
- for remote sensing.
- Computer monitors the activities of astronauts through satellits. Chandrayan-I stepped on moon & scientists are watching all the activities through satellites with the help of computers.

* Application of computers at home :→

- At home, computer is useful for a kid to very senior or old people - kids can play games or do their homework. Monthly budgets can be prepared by elders of family.
- All home appliances i.e. microwave oven, washing machine etc. also uses computer for running more efficiently.
- At home, mothers can find out recipies for their kids.
- One can listen music or can watch movies on computers at homes.

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* Application of computers in Defence : →

- Computers are used in one way or the other in fighter planes, airplanes, on the battlefields in weapons.
- Used in submarines by naval academies.
- Used to communicate by radio in air, under water and on land with computer networks.
- Now-a-days, computers are also used as smart bombs which are actually missiles. but don't look like that.

* Application of computer for data Analysis : →

- A special s/w called spreadsheet program is developed for data analysis with the help of which one can tabulate result, calculate the no. of students, their percentage, their result, list of failed students & average marks etc.
- A particular organisation can prepare about its sale, profit, production, price etc.
- Spreadsheet programs are also used for inventory control, accounts, sale analysis, preparation of budgets, business aspects etc.

* Application of Computers in Graphics : →

- Computers are used to draw pictures & drawing that are otherwise difficult to draw.
- Bar graphs, Line graphs & pie graphs can be drawn easily.
- Several Animated films like Jurassic Part, Jai Hanuman, Bal Ganesha are prepared with help of graphics.
- In theaters, total lightening system, effect of light & sounds etc. are done by computer graphics.

* Application of Computers in Music : →

- Musicians can compose their tunes and music on computer.
- Musicians can translate the music in text form or musical forms using computer.
- To obtain fine editing of music, musicians use different h/w & s/w in synchronization.

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16/3/11

* Application of computers in manufacturing :→

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- In textile industry, computers are used in cutting fabric, stitching buttons, to design all embroidery, colour selection etc.
- In steel industry, computers do work like welding, cutting, painting etc.
- Computers control power production for electricity-generating machines.
- In nuclear industry, temp & pressure inside & outside the boilers can be regulated by computers.
- For control, planning & manufacturing, computers are used in one way or the other.

* Application of Computers in communications :→

- Computers are used in sending & receiving info. through e-mails.
- Internet, a form of communication, is an ocean of information.
- Computer, modem and a data communication package together are used for communication purposes by telephone department.
- Teleconferencing or videoconferencing allow persons sitting at different places to participate in a conference.
- Satellite communication also involve use of computer at its

* Application of computers in book Publication :→

Publishers use computer in different ways e.g. for processing of text, the correction of text referred by proof readers. Sketches, diagrams & illustrations can be easily made. To add pictures, to adjust the position of picture, to change the style & size of headlines, computers are used.

* Applications of computers in Artificial Intelligence :→

A machine with reasoning, learning and logic capability is said to posses artificial intelligence. An artificial system has a knowledge base and programming technique to probe and process the facts in the knowledge base. An expert system is a s/w that utilizes a knowledge base to make decisions in a certain area. Mycin is one such s/w that helps in diagnosing the blood diseases and their remedies.

Completed

* Applications of Computers in Government organisations : →

Computers are used at district level, state level and national levels by each government firm. All district of India are connected by national Informatics Centre (NIC). Govt has started keeping all the databases regarding the legislation of child's birth or deaths, income taxes, sales-taxes, budgets, voter-lists, weather schedule, male/female ratio, crop seasons etc. Now a days, Government passport services are online i.e. one can download passport form or even file or submit the form online sitting at home. Another development is video confesencing. By virtue of this technique, Govt of one state can talk to goverment officials of another state sitting at other end. Now, people can fill up their income tax returns online, the whole database of citizens of city will be computerised one day which will improve the efficiency of goverment.

* Applications of computers in Legal Practices and Law Enforcement:

A layer can not mug up all the acts and sections of law. It is not only difficult but also error prone. So, lawyers can use computers for their record keeping system. Lawyers can keep the record of its clients in computers. There are many types of database which gives information about a particular type of case and the judgement ruled out at different moments by different court & by different judges. This database is very important for reference. Computers help many department of police or crime branch to function more efficiently. DNA technique is a boon for crime branch where figure prints are used to get information about the criminal record of all criminals with their identification and finger print are stored in computers to provide information for apprehending suspects. Forensic science deptt. also uses computers for such purpose. So, computers help the various departments concerning with law, to perform their functions efficiently, effectively and on time.

Computerised

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Unit-4

2nd April, 11

Multimedia :→

Multimedia is a set of more than one media element such as text, graphics, sound, animation and movies used to produce a more structured way of communication. In other words, multimedia is simultaneous use of data from different sources. These source in multimedia are known as media elements.

Multimedia systems are those computer platforms and software tools that support the interactive use of text, graphics animation, audio or motion video. In other words, a computer capable of handling text, graphics, audio, animation and video is called multimedia computer. If the sequence and timing of these media elements can be controlled by the user, it is called as Interactive Multimedia.

Hardware & Software for multimedia computer :→

Hardware components are :-

1. The CPU
2. The monitor
3. Input-output device
4. CD-ROM
5. Sound card
6. Laser Disc
7. DVD

Software components are :—

1. Designer
2. Photo Publisher
3. Photoshop
4. Flash
5. Frontpage
6. Director

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Components of Multimedia :→

1. **Text** :→ Every multimedia presentation contain some text. This text can have various types of fonts and sizes for different presentation of the multimedia. The window interface is provided as standard also, that allow large amount of fonts to be stored in multimedia.

2. **Images** :→ There are two different ways in which images can be described (i) Bitmap Images (ii) Vector Images.

(i) Bitmap Images :→ It assumes that an image consist of two-dimensional square and are called pixel. The quality and size of these images depend on the pixel density and no. of colors used by it. The painting programs are used for creation of bitmap images. Paintbrush is one such programs that is used to draw the objects

(ii) Vector Images :→ It is also called object-oriented format. The image is formed as a set of straight or curved lines and the line can be represented by a mathematical equation. It is more suitable for disk storage space.

3. Animation :→ The animation speed can be increased by using dedicated h/w and s/w. The animation is a continuous series of still images that are displayed in sequence. Two types of animation is used in multimedia.

(i) 2-D Animation :→ It is also called pixel based animation, where flat images are drawn one frame at a time. It is very time consuming but its results are very good. Many animation packages contains, two special effects named morphing and warping. Morphing takes two images and seamlessly changes one image to another. Warping uses one images to show various changes that takes place.

(ii) 3-D Animation :→ It creats 3-D animation mathematical model of 3-D object. It is commonly used in film, video and multimedia packages. 3-D animation follow the modelling, animation and rendering.

4. Digital Audio :→ Audio plays an important role in multimedia development. There are several types of sound, which can be used in multimedia. They are human voices, instrumental notes, natural sound and many more. The are several ways in which these sounds can be incorporated into the computer. e.g.

- Using microphone, human voice can directly be recorded in a computer.
- Pre-recorded cassettes can be used to record the sound into computer.
- Instrumental sound can also be played directly from a musical instrument for recording into the computer.

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5. Digital Video :→

Interactive multimedia use digitised video in its development. Video in multimedia can be playback and record in this way. The process of converting analog video signal to digital format is called sampling. Many systems use digitiser card, for converting audio and video. Many standard, like MPEG (Moving Pictures Expert Group) have specified compression standards, which have enabled a full screen video. The data compressed by MPEG can be decompressed and passed through a digital to analog converter to produce the video.

Applications of Multimedia in Business :→

Multimedia is a very powerful tool for enhancing the quality of business communication. The business communication such as employee related communication, product promotion, customer information and reports for investment can be presented in multimedia form.

A multimedia Kiosk is one of most versatile tool of multimedia. A multimedia kiosk has a touch-screen monitor with a very user-friendly graphical user interface for the ease of operation by general public. Multimedia Kiosks are often used in public places as information providers, in place of help desk with an attendent e.g. a multimedia kiosk placed at an airport gives information about tourist attractions to the travellers and also about the restaurants and hotels alongwith the graphic images and maps showing how to get these. A multimedia kiosk at a beauty centre in a supermarket gives information about the makeup for particular skin types and colors to the customers.

Now-a-days, for business purpose, multimedia based FAX is used which is better than electronic mail because it can be used to send detailed info. for any case, it is easier to use, it provides a printed copy of information and it can also handle graphic information FAX provides a non-interactive interface to the users. Multimedia conferencing is also known as video-conferencing is being used succesful by several business group abroad.

Home-shopping through E-mail is also one of use of multimedia in business. So the multimedia is gaining a lot of popularity for various business purposes.

6/4/11

Application of Multimedia in Advertising :→

For usale purpose, every company often advertise its product and services on television. Most of TV programmers are sponsored by one or more such companies in turn, they get time slots for advertising their products during a specific programme. Several of these advertising use multimedia components like animation to communicate effectively the use of products and their services. For example, if we carefully watch the advertisement for different product like detergents, soaps, powders, toothpastes, insecticides for cockroaches and mosquitoes etc. we will see few scenes in them, which can not be videographed. These scenes are produced by using multimedia technology such as computer animation. So the multimedia has become a popular technology in this ever-changing world of advertising :→

(i) Branding :→ Multimedia is the major way to raise the company's visual identity by holding viewers attention longer while showcasing the brand. The viewers remember video clips and interviews for long time as compared to traditional advertising.

(ii) Impact :→ Multimedia makes the user-experience more dynamic. The video clips are designed in such a way that become more appealing for the viewer and they grab the people's attention.

(iii) Affordability :→ The multimedia in advertising is more cost-effective because it produce best results.

(iv) Emotion :→ Video clips not only reinforce TV branding campaign but also create even deeper experience through interaction.

Applications of Multimedia in Marketing :→

Every marketing company uses multimedia to enhance its scale. Multimedia is necessary for marketing companies to survive the customer. Multimedia is used to create interactive product catalogues, tutorials, buyer guides and information directories with navigation facilities & adequate ficilities to guide the user to easily trace the desired info. A buyer guide can list the nearby dealers, maps of the city & other such services. Multimedia presentations are an excellent way to motivate, inform & captivate a wide range audience like PCs, kiosks, plasma screens & laptops or the internet.

7/4/11

Effective use of multimedia in marketing can make potential clients sit up & make notice. Email advertising ads on internet is best method of launching a product by any marketing company and also to promote selling. Marketing is also used to build brand loyality and to drive inquiries or sales by various companies. Sales may be increased by allowing users to view product options real-time. Brand loyality can be built by giving users a custom application that entertains, informs or assist them. So for various technical services or products, for clear communication stating benefits, marketing uses multimedia components.

Web Application of Multimedia :—>

Web-based multimedia represents the presentation of instruction that involves more than one delivery media, presentation mode and sensory modality.

When thinking about adding media to your web pages, consider first about the nature of your materials & then use images, sound, video or animation to make your message relevant. Few web applications of multimedia are as follows:—

1. Media Communication — This refers to the application which exchange different media over a network via tele-services. The advantage of teleservices in web applications is that the end users can be located in different places & interact closely.

2. Tele-education — Tele education should be understood as development of process of distance. Education, based on use of info. & telecommunication technologies including web, that make interactive, flexible & accessible learning possible for any potential recipient.

3. Tele care — Telecare is a service which provides a telephone contact to senior citizens. The basic purpose of this service is to satisfy the desire of older people to live more independently in their own home & have a daily phone call to assure their health & safety. The tele-care callers also have knowledge of other community services offered to senior citizens & thus are great "Information & Referral" source.

4. Interactive Services — Interactive services includes an exchange of control data bet. remote sites. Interactive services includes conversational services, messaging services & retrieval service. Video-conferencing is one example of conversational services. Multimedia Messaging Services (MMS), short message service (SMS), Enhanced Messaging Services (EMS) are few examples of managing services. Retrieval service describes an activity bet. client & server. It is two-way communication but from client to server, communication is asynchronous & that from server to client can be synchronous or asynchronous.

synchronous
एकसाथ

8/4/11

Subject: Computer Application in Management

Class: - BBA-2nd sem

M.M-50

Time:-3 hrs

Note:-Attempt any five question by selecting at least one question from each unit.

Unit-1

Q.1(a) What do you mean by a digital computer? Explain the classification of computers?

(b) Explain the various functioning units of computers (Basic anatomy)?

Q.2 (a) What are various types of Input/output Devices. Explain?

(b)Explain the operating system in brief?

Unit-2

Q.3(a) What do you understand by a computer network? Explain its benefits & limitations?

(b) what is topology? Explain various topologies?

Q.4(a) What is Wireless networking? Explain its uses in brief?

(b) what is firewall ? Explain virus in brief ?

Unit-3

Q.5 what is Internet? What are its hardware and software requirements? Explain.

Q.6 Explain the following: - a. Internet chatting b. Limitation & Advantages of Internet.

Unit-4

Q.7 What do you understand by multimedia technology? Explain its components .How this technology could be useful to business.? Explain

Q.8. Write short notes on- (a) Multimedia in advertising (b) Web Applications

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