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Q1. (a) Discuss a few limitations of image scanners? How Optical Character Recognition (OCR) device overcomes these limitations? (6)

(b) Elaborate the use of Magnetic Ink Character Recognition Device (MICR)? (6)

Scanners

(A)>limitations of image scanners:>

scanner give only a picture of text or graphic and as result its never be as good in quality in the original documents,its because of sooftware and hardware limitation scanner.

>image produce by the scanner can take a lot of memory space with alssso limitation of image .

>Optical Character Recognition (OCR) device :>

>scanner equippted with character rocognition software (called OCR software)

that convert the bit map image of character to equilent ASCII CODES.

>Enabel word proccecing of input text and also requires less storage for strong the document as text rather than an image.

>optical character recognition software is extreamly complex because it is difficult to make a computer rocognise and unlimited number of type faces and point.

>An OCR system consists of a normal scanner and some special software. The scanner is used to scan text on a document or piece of paper into the computer. The OCR software then examines the page and changes the letters into a form that can be edited or processed by a normal word processing package.

>Although they are often up to 95% accurate, any text scanned with OCR needs careful checking because some letters can be misread.

Ans1)(B) Magnetic Ink Character Recognition Device (MICR):>

>can be used to convert images or text on paper into a digital format that can be used by the computer The term magnetic ink character recognition (MICR) refers to the line of numbers that appears at the bottom of a Check. The MICR line is a group of three numbers, which are the check number, account number, and bank routing number. The MICR number includes the magnetic ink character recognition line printed using technology that allows certain computers to read and process the printed information.

>The technology is also used to print financial forms, credit card invoices, and rebate coupons.

>Magnetic Ink Character Recognition is a character recognition system that uses special ink and characters. When a document that contains this ink needs to be read, it passes through a machine, which magnetizes the ink and then translates the magnetic information into characters.

>MICR technology is used by banks. Numbers and characters found on the bottom of checks (usually containing the check number, sort number, and account number) are printed using Magnetic Ink. To print Magnetic Ink need, you need a laser printer that accepts MICR toner.

>MICR provides a secure, high-speed method of scanning and processing informatio

>Magnetic Ink Character Recognition (MICR) Line Works

The magnetic ink character recognition line is used mainly by the banking industry.

>The MICR number, which is sometimes confused with just the account number, is printed with magnetic ink or toner on a check—usually less than an inch above the bottom of the document. The magnetic ink allows computers to read the characters on a check even if they have been covered with signatures, cancellation marks, bank stamps, or other marks.

>MICR line numbers help facilitate check clearing automatically when banks send their checks to central processing systems at the end of the day. They can also be easily read by people to verify check information.

Q2) Differentiate between printer and plotter?

(A)Difference Between Printer and Plotter)

>Printer and Plotter:>

>Most of us are aware of printers in one or the other form. The most commonly used printers are ones used with computers to take a printout or hard copy of word files from your computer. They are also used to download forms and other information from various sites on a piece of paper. Plotter is a special type of printer that makes use of a pen to create images on paper. Plotter prints vector graphics, whereas printers print alphabets and numerals. There are few similarities and many differences between a printer and a plotter that will be talked about in this article.

>There was a time when plotters used to be a preferred printing device of those who desired large maps and other architectural designs to be copied by their computers. Thus, professionals working on CAD and CAM relied heavily on these plotters. However, with advancement of technology, this function is easily performed by wide format printers and the word plotter is more of a misnomer today. The major difference between a plotter and computer printers that we see in homes and offices lies in the fact that plotter is able to draw lines, whereas conventional printers draw figures through dots. In comparison to a printer that can produce printouts of A4 size papers, plotters can draw plans and layouts of buildings on very large papers, sometimes even 36 inch wide. This obviously makes plotters very large in size when compared to printers.

>A plotter has a movable head that holds a pen like you would hold a pen in your hand. As the paper is fed into the plotter, the head moves forward and backward, creating lines that finally result

in drawings of buildings. As a plotter draws lines, it obviously takes more time to draw an image than a conventional printer, which proceeds making dots on paper. Software that makes heavy use of a plotter is auto CAD, which is used prominently by those involved with architecture and engineering. After drawing a map using auto CAD, a plotter can directly print the map on a piece of paper.

>There is a misconception that plotters cannot create images. Of course they are not designed to draw images like conventional printers, but they are capable of producing some basic images. With a plotter one has the advantage of making very large size drawing, which is advantageous in case of posters. However, a plotter takes a very long time and the quality of the image is also not up to the mark, which is why people prefer laser printers to plotters. Plotters come with a special feature that allows users to rip out the paper from the plotter without tearing the paper. This is because of a cutter that comes along with plotters.

>Difference Between Printer and Plotter:>

> Plotters belong to a sub category of printers

> All plotters can be considered printers, but all printers are definitely not plotters.

> Plotters are used to draw line images, whereas printers are used to draw images through dots

> A plotter holds pen and draws lines, whereas printers make use of laser technology

> A plotter can draw very large images that are of use in architecture, whereas printers can not make use of large papers.

(B)>Explain the printing process of a LASER Printer?

>**Laser printing** is an electrostatic digital **printing process**. It produces high-quality text and graphics (and moderate-quality photographs) by repeatedly passing a **laser** beam back and forth over a negatively charged cylinder called a "drum" to define a differentially charged image.

>Laser printing>>1969

>The laser printing process can be broken down into seven major steps:

Each printing process is divided into prepress, press, and postpress steps.

>Prepress operations encompass steps during which the idea for a printed image is converted into an image carrier such as a plate, cylinder, or screen.

>Step 1> Sending:>

>To begin the laser printing process, the document is sent from the respective computer to the laser printer and the sent document is processed by the laser printer.

>Step 2> Cleaning:>

>Cleaning is a physical and electrical process carried out in order to remove the previous print job and prepare the photosensitive drum for the new print job. Remnants of toner on the drum are scraped away by a rubber-cleaning blade into a debris cavity. Remnants of electrical charges on the drum from the previous print job are defused by electrostatic erase lamps. Lubrication is then applied to the heat roller in order to make sure an adequate amount of heat is evenly applied to transfer the incoming image.

>Step 3> Conditioning :>

Conditioning involves applying a negative charge to the drum unit and the paper as it passes through the corona wire or transfer roller. The application of a negative charge to the paper allows an image to be electrostatically transferred to the page.

>Step 4> Exposing :>

>Laser time! The next step is exposing. In this step, the photosensitive drum is exposed to a laser beam, (possibly a laser beam refracted from a spinning mirror inside the printer). Every area of the drum exposed to the laser beam has its surface charge reduced to about 100 volts DC. An invisible latent image is generated as the drum turns.

>Step 5> Developing :>

>In the developing step, toner is applied to the latent image on the drum. The toner is comprised of negatively-charged powdered plastics — black, cyan, magenta, and yellow. The drum is held at a microscopic distance from the toner by a control blade.

>Step 6> Transferring :>

>The next step is transferring. The secondary corona, or transfer, applies a positive charge to the paper. The negatively-charged toner on the drum is magnetically attracted to the now positively-charged paper. The image is transferred to the paper and maintains its position due to its positive charge.

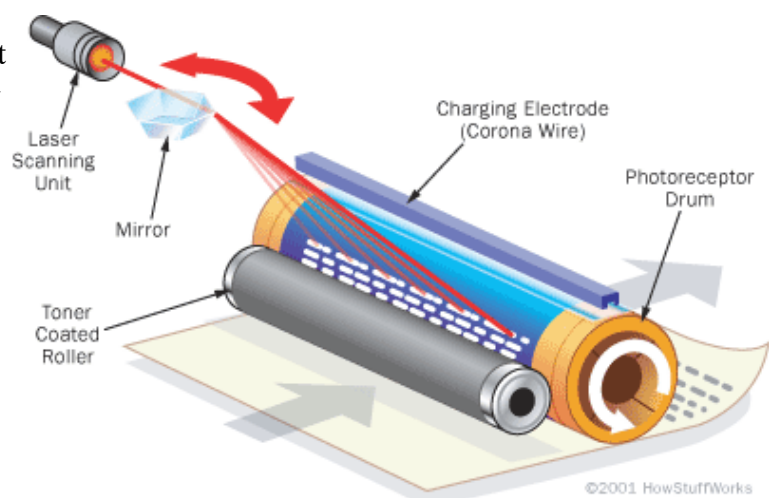
>Step 7>Fusing :>

>The final step is fusing. Heat and pressure are applied to the toner by the fusing rollers. The toner generates a permanent bond as it is pressed and melted into the paper. Teflon covers the fusing rollers as a light silicon oil is applied in order to remove any possibility of the paper sticking to them

>LASER Printer:>

>The laser receives the page data -- the tiny dots that make up the text and images -one horizontal line at a time. As the beam moves across the drum, the laser emits a pulse of light for every dot to be printed, and no pulse for every dot of empty space.

>The laser doesn't actually move the beam itself. It bounces the beam off a movable **mirror** instead. As the mirror moves, it shines the beam through a series of **lenses**. This system compensates for the image distortion caused by the varying distance between the mirror and points along the drum.



Q3) Explain Metropolitan Area Network (MAN) with a suitable example?

A) Metropolitan Area Network (MAN):>

>The MAN network (Metropolitan Area Network) is a high-speed network (broadband) that covers larger geographic area such as city (tens of kilometers) or districts than local area network (LAN) but smaller than wide area network (WAN) and providing the ability to integrate multiple services through the transmission of data, voice, and video, on transmission media such as copper, fiber optics, and microwaves.

>The term is applied to the single network such as a cable television network, or it can be a way of connecting a certain number of LANs in a more extensive network so that resources can share from LAN to LAN and from device to device. For example, a company can use a MAN to connect the LANs of all its offices scattered around the city. Local libraries and government agencies often use a MAN to connect to citizens and private industries. It may also connect MANs within a larger area than LAN. The geographical limit of a MAN may span a city.

>A MAN can wholly own by a private company, which will be its operator, or it can be a service provided by a public service company, such as a local telephone company. Many telephone companies have a very popular MAN service called Multimegabit Data Switching Services (SMDS).

>The copper pair technology positioned as the world's largest network an excellent alternative for the creation of metropolitan networks, for its low latency (between 1 and 50 ms), excellent stability and the lack of radio interference, the MAN LOOP networks, offer speeds of 10 Mbit/s or 20 Mbit/s, on copper pairs and 100 Mbit/s, 1 Gbit/s and 10 Gbit/s through optical fiber.

>The concept of the metropolitan area network represents an evolution of the concept of a local area network to a broader scope, covering larger areas that in some cases are not limited to an urban environment but can reach regional and even national coverage through the interconnection of different networks of the metropolitan area.

>This type of networks is a larger version than the LAN and usually based on a technology similar to this one. The main reason to distinguish a MAN with a particular category is that a standard has adopted to make it work, which is equivalent to the IEEE standard.

>WAN networks also applied in organizations, in groups of corporate offices near a city, these do not contain switching elements, which divert the packets by one of several potential output lines. These networks can be public or private.

>The networks of the metropolitan area, comprise a specific geographical location "city, the municipality," and its distance of coverage is greater than 4 km. They are networks with two unidirectional buses, each of which is independent of the other in terms of data transfer.

>Example:-

- An example of public MAN is the infrastructure that a telecommunications operator installs in a city to offer broadband services to its customers located in this geographical area.

>Network nodes:>

> Citizen area networks allow to execute and exceed 600 access nodes to the network, which makes it very useful for public and private environments with a large number of jobs.

>Network extension:>

>The networks of metropolitan area allow to reach a diameter around 50 km, depending on the scope of network training of the type of cable used, as well as the technology used. This diameter is considered sufficient to house a metropolitan area. They cover a city and can connect many, forming more networks.

>Examples of metropolitan area networks of various sizes can be found in the metropolitan areas of Pakistan, London, England; Lodz, Poland; and Geneva, Switzerland. Large universities also sometimes use the term to describe their networks. A recent trend is the installation of wireless MANs.

B)*Define topology? Which topology would you chose to setup a local area network and why?

>Define topology:-

Network topology is the interconnected pattern of network elements. A network topology may be physical, mapping hardware configuration, or logical, mapping the path that the data must take in order to travel around the network.

There are many identified topologies but they are not strict, which means that any of them can be combined. However, each topology has a different standard and may use different hardware methods so they are not interchangeable.

>Star Topology:>

>This study focused on a star network topology. A star network is a local area network in which all devices are directly linked to a central point called a hub. Star topology looks like a star but not exactly a star.

>Star networks are one of the most common computer network topologies that are used in homes and offices. In a Star Network Topology it is possible to have all the important data backups on the hub in a private folder and this way if the computer fails you can still use your data using the next computer in the network and accessing the backup files on the hub. It has come to realization that this type of network offers more privacy than any other network.

Star is one of the most and oldest common topology in the local area network. The design of star topology comes from telecommunication system.

The main objective of this project is to discuss the advantages, disadvantages and usage of star network topology. A topology is a physical structure of a network. Star topology is a network

structure comprising a central node to which all other devices attached directly and through which all other devices intercommunicate

>Use OF STAR NETWORK:>

Star topology is a networking setup used with 10BASE-T cabling (also called UTP or twisted-pair) and a hub. Each item on the network is connected to the hub like points of a star. The protocols used with star configurations are usually Ethernet or local-talk. Token Ring uses a similar topology, called the star-wired ring .

Star Topology is the most common type of network topology that is used in homes and offices. In the Star Topology there is a central connection point called the hub which is a computer hub or sometimes just a switch. In a Star Network the best advantage is when there is a failure in cable then only one computer might get affected and not the entire network.

Star topology is used to ease the probabilities of network failure by connecting all of the systems to a central node. This central hub rebroadcasts all transmissions received from any peripheral node to all peripheral nodes on the network, sometimes including the originating node. All peripheral nodes may thus communicate with all others by transmitting to, and receiving from, the central node only (From Wikipedia, the free encyclopedia).

Star network is used to transmit data across the central hub between the network nodes. When a packet comes to the hub it transfers that packet to all nodes connected through a hub but only one node at a time successfully transmits it.

In local area networks where the star topology is used, each machine is connected to a central hub. In contrast to the bus topology, the star topology allows each machine on the network to have a point to point connection to the central hub and there is no single point of failure. All of the traffic which transverses the network passes through the central hub. The hub acts as a signal booster or repeater which in turn allows the signal to travel greater distances.

When it is important that your network have increased stability and speed, the star topology should be considered. When you use a hub, you get centralized administration and security control, low configuration costs and easy troubleshooting. When one node or workstation goes down, the rest of your network will still be functional.

Q4. In your opinion, what are the different types of common media used for storage, access and transmission of information? Explain each type in detail? (10)

Ans)>Common media:>

>comon media for storage, acces, and transmission of information

>When talking about reaching a very large number of people we say mass media. Local media refers to, for example, your local newspaper, or local/regional TV/radio channels

>*We used to get all our news and entertainment via TV, radio, newspapers and magazines. Today the Internet is gradually taking over. Print newspapers are struggling as hundreds of millions of people each year switch to news sources online.*

.>types of common media:>

>Text media (alphanumeric characters)

>Graphics(line drawing and images.

>Animation (moving images)

>Audio(sound)

>Video(videographed real-life events)

>Multimedia in information technology refers to use of more than one of these media for information to users.

1>Text media (alphanumeric characters):>

The media text is any media product we wish to examine. Every description or representation of the world, fictional or otherwise, is an attempt to describe or define reality, and is in some way a construct of reality, a text.

1. >Keyboards, OCRs, computer screens, and printers are some commonly used hardware devices for processing text media

- Text editing, text searching, hypertext, and text importing/exporting are some highly desirable features of a multimedia computer system for better presentation and use of text information

2. >Graphics(line drawing and images):>

>Computer graphics deals with generation, representation, manipulation, and display of pictures (line drawings and images) with a computer

>Locating devices (such as a mouse, a joystick, or a stylus), digitizers, scanners, digital cameras, computer screens with graphics display capability, laser printers, and plotters are some common hardware devices for processing graphics media

>Some desirable features of a multimedia computer system are painting or drawing software, screen capture software, clip art, graphics importing, and software support for high resolution

3. >Animation (moving images):>

>Computer animation deals with generation, sequencing, and display (at a specified rate) of a set of images (called frames) to create an effect of visual change or motion, similar to a movie film (video)

- Animation is commonly used in those instances where videography is not possible or animation can better illustrate the concept than video

- Animation deals with displaying a sequence of images at a reasonable speed to create an impression of movement. For a jerk-free full motion animation, 25 to 30 frames per second is required

>Scanners, digital cameras, video capture board interfaced to a video camera or VCR, computer monitors with image display capability, and graphics accelerator board are some common hardware devices for processing animation media

>Some desirable features of a multimedia computer system with animation facility are animation creation software, screen capture software, animation clips, animation file

importing, software support for high resolution, recording and playback capabilities, and transition effects

4. >Audio(sound):>

>Computer audio deals with synthesizing, recording, and playback of audio or sound with a computer

>Sound board, microphone, speaker, MIDI devices, sound synthesizer, sound editor and audio mixer are some commonly used hardware devices for processing audio media

>Some desirable features of a multimedia computer system are audio clips, audio file importing, software support for high quality sound, recording and playback capabilities, text-to-speech conversion software, speech-to-text conversion software, and voice recognition software

5. >Video(videographed real-life events)

>Computer video deals with recording and display of a sequence of images at a reasonable speed to create an impression of movement. Each individual image of such a sequence is called a frame

>Video camera, video monitor, video board, and video editor are some of the commonly used hardware devices for processing video media

>Some desirable features of a multimedia computer system with video facility are video clips and recording and playback capabilities

6. >Multimedia in information technology refers to use of more than one of these media for information to users.

7. >Multimedia Applications:>

8. Multimedia presentation

>Foreign language learning

>Video games

>Special effects in films

>Multimedia kiosks as help desks

>Animated advertisements

>Multimedia conferencing

>Media Center Computer:>

>There is a growing trend of owning a personal computer (PC) at home like other electronic equipment

>New terminologies like “infotainment” and “edutainment” have evolved to refer to computers as versatile tools

>Media center PC provides following functionalities:

>Serve as PC, TV, radio, and music system

>Serve as digital photo album and digital library

>Serve as Game station and DVD/CD Player

>Allows play, pause, and record of TV programs

>Provides Electronic Programming Guide (EPG).