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**Paper Computer Applications**

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

**Image scanners**

Scanner is a data input device which scans the thing into the pc. It a device that optically scans images, printed text, handwriting, or an object converts it to a digital image. Scanner may be a device that translates text into soft copy. It translates data on a sheet of paper to a form that can be stored on a computer. Data can be in either form of text or graphics.

**Types of Scanner**

- Flatbed scanner
- Slide scanner
- Handheld scanner
- Drum scanner

**Limitations**

**Image scanner saves the file only in the image format**

**Scanned Output Quality Can Vary**

The quality of the scanned output can vary quite bit, counting on variety of things. Some of these factors include the standard of the lens inside the scanner, how clean the scanner glass is and therefore the condition of the first documents. If the first documents are available in electronic format, it's often better to use a program such Adobe Acrobat to convert them to a PDF format that anyone with Internet access can read.

**Scanner Maintenance Can Be Expensive**

Many companies uses high-volume scanners to affect large quantities of paperwork. While these high-volume scanners are often good tools, many business owners don't realize how costly supplies and care are often. To keep a high volume scanner running at peak performance, owners will got to replace the lamps regularly and perform maintenance on the camera and lens also. This maintenance are often quite costly, so it's important for business owners to weigh these costs against the worth of other document imaging solutions.

**Scanners are Relatively Slow**

Scanners also are relatively slow, so companies and individuals users will got to consider the time involved in scanning all of their paperwork. Automatic feeders can help to hurry production, but it can still take an excellent deal of your time to scan a stack of documents. In addition, scanner operators will got to carefully check the scanned documents to form sure that each one pages are imaged. It is commonplace for pages to stay together when browsing the automated document feeder, so operators will got to be trained to observe for these problems.

**Recognition (OCR)**

Although Optical Character Recognition (OCR) scanning technology has increased rapidly over the years, there are, however, limitations with regard to the source and character formatting. (OCR) Optical Character Recognition is that the mechanical or electronic conversion of images of typewritten or printed text into machine-encoded.

**Following are the few advantages of OCR**

**Faster Searches:**

OCR software allows one to realize more productivity because it enables fast retrieval of knowledge when needed. The efforts and time that the worker won't to put in to extract the relevant data can now be utilized for that specialize in core competencies.

**Reduced Cost:**

Besides helping a corporation in lowering the value of hiring manpower for data extraction, OCR also helps in reducing several other costs like printing, copying, delivery fee, etc.

**Reduced Errors:**

Several organizations are marred by the problem of data loss and inaccuracy. OCR involves the rescue and helps in reducing errors.

**More Storage Space:**

The lesser the documents, the larger the space. Organizations have always wanted to require the 'Paperless' approach and OCR just makes it possible. Also, the costs of file cabinets are saved with OCR.

**Ready Availability:**

By scanning the knowledge off documents through OCR, the info are often made available in several different places. One can carry it during a USB drive and retrieve the wanted information with just a couple of clicks.

**Efficient Management:**

With the OCR system, managing data of confidential documents becomes easy and effortless as everything becomes automated.

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

**Magnetic Ink Character Recognition Device (MICR)**

MICR stands for Magnetic Ink Character Recognition. MICR is an equipment which allows machines to read and process cheques enabling thousands of cheque transactions during a short time. MICR code is typically a nine digit code comprising of some important information about the transaction and therefore the bank. The MICR line is within the bottom of the documents which incorporates document type, account number, bank code, cheque number and control indicator. The MICR code reader easy read the line and send it to the info collection devices. Unlike Barcodes, MICR code can easily read by humans and it's printed at rock bottom of the cheque.

**Uses of MICR Code**

MICR may be a character-recognition technology used mainly by the banking system to ease the processing and clearance of cheques and other documents. MICR offers a secure, high-speed system of scanning and processing information. Unlike barcodes and similar technologies, MICR characters are often read easily by humans. The use of MICR allows the characters to be read reliably albeit they need been overprinted or obscured by other marks, like cancellation stamps and signature.

**Uses of MICR Code in Cheques**

The MICR code is present in the bottom of the Cheque. The first three digits within the MICR code represent the town code that's the town during which the bank branch is found. In most cases it is in line with the PIN code of the postal addresses in India. The next three digits represent the bank code.

**Fonts for MICR**

MICR uses two major fonts: - E-13B and CMC-7. E-13B features a 14 list, while CMC-7 has 15—the 10 numeric characters, plus control characters. The MICR E-13B font is that the standard in Australia, Canada, the Uk, the US, and other countries. Major European countries, including France and Italy, et al.

**MICR Reader**

MICR characters are printed in special typefaces with an ink or toner, usually containing iron oxide. As a machine decodes the MICR text, it first magnetizes the characters within the plane

of the paper. Then the characters are omitted a MICR read head, a tool almost like the playback head of a tape machine. As each character passes over the top it produces a singular waveform which will be easily identified by the system.

**Q2. (a) Differentiate between printer and plotter?**

**Printers**

In computing, Printer may be a peripheral which produces a representation of an electronic document on physical media like a paper or transparency film. Many printers are local peripherals connected on to a close-by pc. Individual printers are often designed to support both local & network connected users at an equivalent time. Consumer & some commercial printers are designed for low-volume, short-turnaround print jobs; requiring virtually no setup time to realize a tough copy of a given document.

**Plotter**

The Plotter may be a computer printer for printing vector graphics. In the past, plotters were utilized in applications like CAD, though they need generally been replaced with wide-format conventional printers. Pen plotters print by moving a pen or other instrument across the surface of a bit of paper. This means that plotters are vector graphics devices. Pen plotters can draw complex line art, including text, but do so slowly due to the mechanical movement of the pens.

**Difference**

| **Printer** | **Plotter** |
|---|---|
| A printer is an external (peripheral) hardware output device that takes the electronic data stored on a computer or any other storage device and generates a hard copy of the data | A plotter is an output device commonly used for computer-aided design applications, to output large vector designs such as architectural blueprints. |
| Printer is a peripheral device in nature and creates a solid copy of the digital data that is represented on the computer screen. | The plotter is either a peripheral component that you add to computer system or a standalone device with its own internal processor. |
| Printers can read BMP, PDF and JPG TIFF formats. | Plotters can read files in the DWG, CDR, Al and other vector formats. |
| Software for printers includes Photoshop and any other image-editing program | Plotter software includes Adobe Illustrator, Corel, Flexi and CAD. |
| Printers are less costly when compared to plotters. | Plotters are relatively expensive when compared to printers. |

| | |
|---|---|
| A printer provides the output file data in a format such as bitmap or pixels. | A plotter provides the output in a format that is similar to a vector graphic/ image created with lines. |
| Printers are mainly used to produce graphics and text on a physical medium such as paper. They are also, mostly used by graphic artists for posters, signs and other professional quality display. | Plotters are mainly used in specialized fields such as drawing, architecture and engineering. |
| Printers are resolution dependent, an image produced by a printer (raster image) is enlarged, and the size of the pixels simply gets bigger resulting in distortion of the image. | Usually, plotters are resolution independent, an image produce by a plotter can be enlarged to any size without losing clarity. |
| There two main type of printers, they include impact and non-impact printers. | There are four main types of plotters; they include Drum plotter, Flatbed plotter, Inkjet plotter and Cutting plotter. |

**(b) Explain the printing process of a LASER Printer?**

**Laser Printer**

An electrostatic printer may be a printer that uses a focused beam or light to transfer text and pictures onto paper. Though contrary to popular belief, the laser doesn't actually burn the pictures onto the paper. Instead, as paper passes through the printer, the beam fires at the surface of a cylindrical drum called a photoreceptor. This drum has an electrical charge (typically positive), that's reversed in areas where the beam hits it. By reversing the charge in certain areas of the drum, the beam can print patterns (such as text and pictures) onto the photoreceptor.

**Laser Printing Process**

**Cleaning:** Before a replacement page is printed, any remaining from the previous page are cleared away. The drum is swept free with a rubber blade, and a lamp removes any electrical charge remaining on the drum.

**Conditioning:** the whole drum is uniformly charged by the first corona wire. This charge conditions the drum for the next step.

**Writing:** The electrostatic printer controller uses a beam and a series of mirrors to make the image of the page on the drum. The beam is turned on and off in accordance with the image to be created on the drum.

**Developing:** A magnet inside the developing roller attracts the iron particles within the toner. This roller rotates near the drum and therefore the toner is interested in the areas of the drum that are exposed by the laser, creating the print image on the drum. (Toner: the electrostatic image is made by changing the fees on different places. The drum continues to revolve and therefore the toner sticks to the charged places of the text.)

**Transferring:** A magnet inside the developing roller attracts the iron particles within the toner. This roller rotates near the drum and therefore the toner is interested in the areas of the drum that are exposed by the laser, creating the print image on the drum. • Fusing: The fusing rollers apply heat and pressure to the toner, which melts and presses it into the paper to make a permanent bond. The rollers are covered with Teflon and treated with a light-weight silicon oil to stay the paper from sticking to them.

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

The metropolitan area network (MAN) is meant to increase over a whole city. It may be one network like cable television network available in many cities. A MAN uses distributed queue dual bus. Range: Within 100 km (a city).

It provides an honest back bone for an outsized network and provides greater access to WANs. The dual bus utilized in MAN helps the transmission of knowledge in both direction simultaneously. A Man usually encompasses several blocks of a city or a whole city.

MAN is employed to mix into a network group located in several buildings into one network. These networks are so big and can range from 5 to 50 kilometers. As a rule, MAN doesn't belong to any particular organization, in most cases, a gaggle of users or a provider who takes charge for the service own its connecting elements and other equipment. Level of service is agreed beforehand and a few warranties are discussed. MAN often acts as a high-speed network to permit sharing regional resources (like an enormous LAN). It is also often wont to provide public available connection to other networks employing a WAN connection. There are many ways of classifying networks.

The main condition for classification is seeing the administration method. That is, counting on how the network is organized and the way it's controlled, it are often attributed to local or distributed, metropolitan or WAN. Computers are often connected employing a sort of media access controllers: a twisted pair, optical conductors (optical cables) and via radio (wireless technology). Wired optical connections are usually established via Ethernet, wireless - through Wi-Fi, Bluetooth, GPRS and other protocols. Private LAN may be linked to other local area networks through gateways, as well as being part of a global computer network (e.g., the Internet), or have a connection to it.

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

A topology may be a description of the layout of a selected region or area. A topology may be a description of the layout of the region or area covered by that network.

There are six basic topologies:

1. Bus topology
2. Star topology
3. Ring topology
4. Mesh topology
5. Tree topology
6. Hybrid topology

**Topology for setup local Area Network**

The Star or Hub topology is one among the foremost common network topologies found in most offices and residential networks. It has become very fashionable in contrast to the bus type (which we just spoke about), due to the value and therefore the simple troubleshooting.

The advantage of the star is that if one computer on the star fails, then only the failed computer is unable to send or receive data. The remainder of the network functions normally.

The disadvantage of using this topology is that because each computer is connected to a central hub or switch, if this device fails, the whole network fails!

A classic example of this sort of topology is that the UTP (10 base T), which normally features a blue color. Personally I find it boring, so i made a decision to travel out and obtain myself green, red and yellow colors.

**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?**

Following are the types of common media used for storage access and transmission of information:

I. USB Flash Memory.
II. CD, DVD and Blu-Ray Discs.
III. Hard Disk Drive (HDD)
IV. Solid State Drive.

**Usb flash memory**

Flash memory Storage flash memory may be a solid-state chip that maintains stored data with none external power source. It is commonly utilized in portable electronics and removable storage devices, and to exchange computer disk drive flash memory is widely use in smart phone, camera, and portable media player.

**CD, DVD and Blu-Ray Discs**

**CD** stands for Compact Disc. It is mainly wont to store photos, audio and computer software. The compact disks existed in three types which are read only recordable and rewriteable.

**DVD** stands for Digital Video Disc. The storage capacity of DVD is far greater than CD. It can store up to 17 GB of knowledge. DVDs are existed in three forms which are read-only, recordable and rewritable

**Blu-Ray disc** may be a new and costlier DVD format. These discs have higher capacity and better quality than standards DVDs especially for high-definition video. It can store up to 100 GB of information.

**Hard disk Drive**

A hard disk is a component of a unit, often called a "disk drive," "hard drive," or "hard disc drive," that stores and delivers relatively quick access to large volumes of data on an electromagnetically charged surface or set of surfaces. Today's computers typically accompany a tough disk that contains several billion bytes (gigabytes) of storage. A hard disk is basically a group of stacked "disks," each of which, like phonograph records, has data recorded electromagnetically in concentric circles or "tracks" on the disk. A "head" records or reads the

knowledge on the tracks. Two heads, one on all sides of a disk, read or write the info because the disk spins.

**Solid state drives**

Solid state drives the most recent flash memory application, SSDs can replace a computer's disk drive. The solid state drive have no moving part, so mechanical failure is near zero. Solid-state drives are soundless and slighter than hard drives, and that they provide faster response, access and boot-up times but consume much less power and run cooler.