

## PERIPHERAL AND INTERFACES

2017

### PART -A

1. Attempt any ten questions.

10X2=20

i) List few display devices.

- Cathode Ray Tube Display
- LCD Display
- LED Display

ii) A hard disk is divided into tracks which are further subdivided into sectors.

iii) Define the term actuators.

An actuator is a device or machine that helps it to achieve physical movement by converting electrical energy into mechanical force.

There are two types of actuators

- Voice Coil Actuator
- Steeper Motor

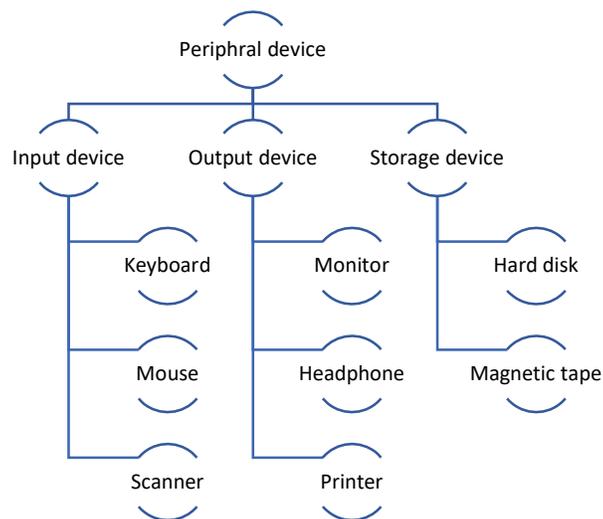
iv) What is the full form of CD-ROM.

compact disc read-only memory

v) Define computer peripherals.

A peripheral device is defined as the device that provides input/output functions for a computer and serves as an auxiliary computer device without computing intensive functionality. It is a device that is connected to a computer system but is not part of the core computer architecture. Generally, more people use term peripheral more loosely to refer a device external to the computer case.

Classification of peripheral devices. Generally, it is classified into 3 basic categories given below.



**vi) What are types of interfaces?**

These three types of storage interfaces serve as the infrastructure for your data transfers

- SCSI (Small Computer System Interface)
- IDE (Integrated Drive Electronics)
- EIDE (Enhanced Ide)

**vii) What is the concept of light pen?**

A light pen is a light-sensitive computer input device, basically a stylus, that is used to select text, draw pictures and interact with user interface elements on a computer screen or monitor. The light pen works well with CRT monitors because of the way such monitors scan the screen, which is one pixel at a time, giving the computer a way to keep track of the expected scanning time by the electron beam and infer the pen's position based on the latest timestamp of the scanning.

**viii) How many devices can be managed by a single SCSI controller?**

Seven devices can be managed by a single SCSI controller.

**ix) Define partitioning.**

As suggesting from the name, partitioning means divisions. Partitioning is the process of dividing the hard-disk into one or more regions. The regions are called as partitions. It can be performed by the users and it will affect the disk performance.

**x) For what purpose pen drive is used for?**

The commonest use of USB pen drive is to transport or store personal files such as documents, pictures and video.

**xi) Define bandwidth of MODEM.**

It measures how much data can be sent over a specific connection in a given amount of time. An Internet connection via cable modem may provide 25 Mbps of bandwidth.

**xii) What do you mean by I10 port?**

**xiii) What is printer?**

A printer is a hardware output device that is used to generate hard copy and print any document. A document can be of any type such as a text file, image, or the combination of both. It accepts input command by users on a computer or on other devices to print the documents.

**xiv) What is Zip drive?**

A Zip drive is a medium-capacity and portable magnetic disk storage system launched by Iomega in the mid-1990s. It was popular at the time of launch as cost per storage unit was lower than that of hard disks, and it could store a larger amount of data than a floppy disk. The Zip drive was capable of fast data transfer and was durable and reliable.

**2. Attempt any five questions.**

**5x4=20**

**i) Compare features of SCSI interface over IDE interface.**

SCSI	IDE
Small Computer System Interface	Integrated Drive Electronics.
SCSI provide a quicker data transfer rate.	The IDE has a slower data transfer rate.
SCSI configuration is more complex	IDE configuration is simpler as compared to SCSI
SCSI is more expensive	IDE is less expensive

**ii) Write brief note on basic concept of PAL and NTSE standards.**

NTSE (National Television Standard) and PAL (Phase Alternating Line) are two types of colours encoding systems that affect the visual quality of content viewed on analog televisions and, to a much smaller degree content viewed on HDTV's while NTSE delivers a frame rate of 30 frames per seconds at an aspect ration of 720x480 pal uses of frame rate of 25 FPS and a 725x576 aspect the PAL system offers automated colour correction compared to NTSE manual colour correction. The NTSC's standard is popular in places like the U.S, and Japan while PAL is more common in country such as U.K., Australia, and Sweden

**iii) Differentiate between inkjet printer and laser printers.**

<b>Inkjet Printer</b>	<b>Laser Printer</b>
It is cheap in price.	It is expensive than Inkjet Printers.
They have nozzle from which ink is sprayed onto paper and it gets printed.	They do not have nozzle.
Ink in the cartridges is in liquid form, which dries if not used for a long time.	Ink is in the form of toner (powder), it does not dry up even if you don't use it for a long time.
At last, buying these printers in not expensive but using it over time costs more and more.	Buying these laser printers, is expensive at first but using it over time it costs less than Inkjet Printers.

**iv) What is difference between Raster Scan and Vector Scan?**

<b>Raster Scan</b>	<b>Vector Scan</b>
The resolution of raster scan is lesser or lower than Vector scan.	The resolution of random scan is higher than raster scan.
Cost is lesser than vector scan.	It is costlier than raster scan.
While in raster scan, interlacing is used.	In random scan, interlacing is not used.
Electron Beam is directed from top to bottom and one row at a time on screen. It is directed to whole screen.	Electron Beam is directed to only that part of screen where picture is required to be drawn, one line at a time.

**v) Explain the function of stepper motors.**

stepper motor is a type of brushless synchronous DC motor that. are a type of digital input-output device for precision starting and stopping They're constructed so that the current passing through it hits a series of coils arranged in phases, which can be powered on and off in quick sequence. This allows the motor to turn through a fraction of a rotation at a time - and these individual predetermined phases as what we refer to as 'steps'. These were usually used to move the read/write head using wheel and spring mechanism which works quite well. According one information source those stepper motors used in disk drives were usually 200 or 400 steps per revolution models

**vi) Write about printer's specifications.**

**vii) Write a short note on digitizer.**

A digitizer is a hardware device that receives analog information, such as sound or light, and records it digitally. Usually, the information is stored in a file on a computing device. This process is called digitization.

For example, a digital camera is a digitizer. Light enters through the camera lens, and the hardware and software inside the camera converts that information to binary data, and stores it an image file. The user may then transfer the file to a computer, where he or she can edit the image, print it out, or share it online.

**viii) Write a short note on CGA.**

Short for Colour Graphics Adapter, CGA was an early IBM video adapter that replaced monochrome and was first introduced in 1981. CGA has the highest resolution of 640 x 200, colour depth of 4-bit, and supports 16 colours (24 = 16). Today, CGA is rarely found or used after being replaced by more advanced technologies like EGA and VGA.

**PART -B**

**3 (a) Explain the important characteristics of the following video standards: -**

**3x20=60**

**i) VGA**

(Video Graphics Array) VGA is an analog interface between a PC and monitor that was widely used prior to DVI, HDMI and DisplayPort adopted in the late 1980's designed for CRT displays, also called VGA connector. VGA cables have 15-pin connectors: 5 pins at the top, 5 pins in the middle, and the other 5 at very bottom. Some problems of their standard are electrical noise, image distortion and sampling error in evaluating pixels. Today, the VGA analog interface is used for high-definition video including 1080p and higher. While the VGA transmission bandwidth is high enough to support even higher resolution playback, there can be picture quality degradation depending on cable quality and length. How discernible this quality difference is depending on the individual's eyesight and the display.

**ii) SVGA**

Short for Super Video Graphics Array, SVGA is a set of video standards one step above VGA. SVGA monitors are capable of displaying up to 16 million colours with a resolution of 800 x 600 on 14-inch monitors and up to a 1200 x 1600 resolution on a 20-inch. The picture shows what the typical VGA/SVGA connection. Today, SVGA is being phased out by the connection known as DVI. It contains 15-pins too same pinout as a VGA cable.

**(b) With the help of a neat block diagram Explain the working of a CRT monitors.**

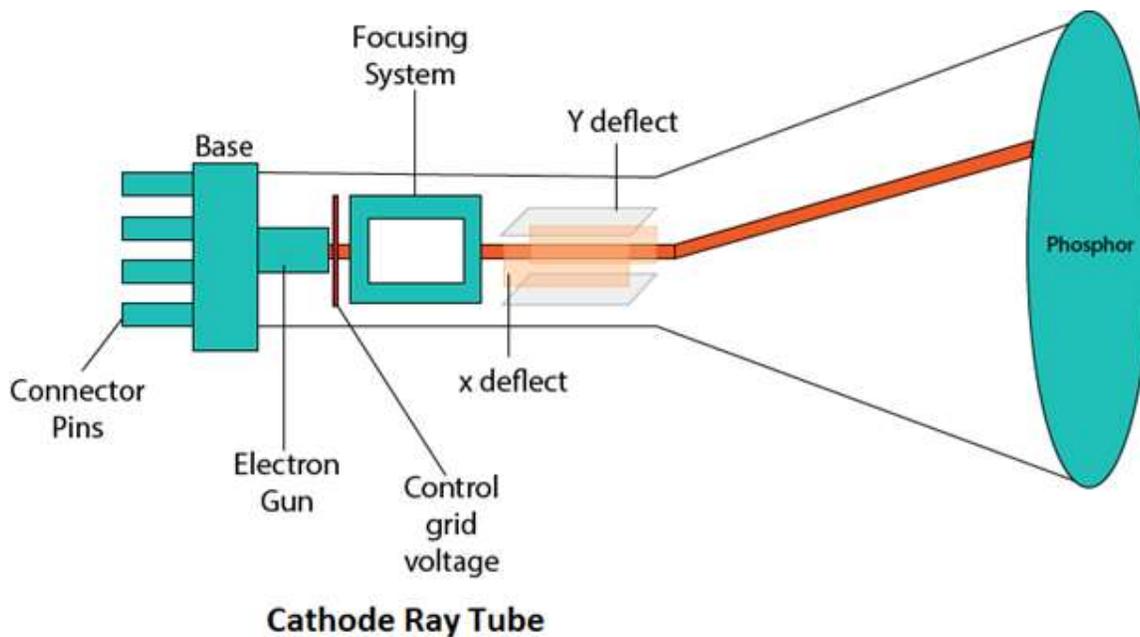
CRT stands for Cathode Ray Tube. CRT is a technology used in traditional computer monitors and televisions. The image on CRT display is created by firing electrons from the back of the tube of phosphorus located towards the front of the screen.

Once the electron heats the phosphorus, they light up, and they are projected on a screen. The colour you view on the screen is produced by a blend of red, blue and green light.

**Components of CRT:**

Main Components of CRT are:

- 1. Electron Gun:** Electron gun consisting of a series of elements, primarily a heating filament (heater) and a cathode. The electron gun creates a source of electrons which are focused into a narrow beam directed at the face of the CRT.
- 2. Control Electrode:** It is used to turn the electron beam on and off.
- 3. Focusing system:** It is used to create a clear picture by focusing the electrons into a narrow beam.
- 4. Deflection Yoke:** It is used to control the direction of the electron beam. It creates an electric or magnetic field which will bend the electron beam as it passes through the area. In a conventional CRT, the yoke is linked to a sweep or scan generator. The deflection yoke which is connected to the sweep generator creates a fluctuating electric or magnetic potential.
- 5. Phosphorus-coated screen:** The inside front surface of every CRT is coated with phosphors. Phosphors glow when a high-energy electron beam hits them. Phosphorescence is the term used to characterize the light given off by a phosphor after it has been exposed to an electron beam.



**4 (a) Explain what are MFM and RLL in detail.**

**MFM**

MFM (Modified Frequency Modulation) is a scheme for encoding data on single-density floppy disk or Hard Drive.

- More data can be stored on the same surface or the data storage density can be increased, if the number of pulses required to store the data can be minimized.
- When minimizing the pulses, one should be careful that the number of no pulses together should not be very long; otherwise, the disk controller may go out of synchronization with the data.
- The MFM (modified frequency modulation) method of data storage, by reducing the number of pulses, is able to store more data without any data and synchronization number of pulses, is able to store more data without any data and synchronization loss. In MFM recording the 0s and 1s are encoded as given below
- 1 is always stored as no pulse, and a pulse (NP)
- 0, when preceded by another 0, is stored as a pulse, and no pulse (PN)
- 0, when preceded by a 1, is stored as two no pulses (NN)
- If you store 1001 on the disk surface using the MFM storage method, it would be stored as NP NN PN NP.

**RLL**

The RLL is encoding or the run length limited encoding is the most common encoding scheme used in the hard disk storage.

- This encoding scheme can be more accurately called as 2,7 RLL encoding because in this scheme in a series or in a running length the minimum number of 0s next to each other is two, and the maximum number of 0s together cannot be more than seven
- The RLL encoding scheme can store 50 percent more information than MFM encoding scheme on a given surface and it can store three times as much information as the FM encoding scheme. The Run length Limited name comes from the minimum number (run Length) and maximum number (run Limit) of “no pulse” values allowed between two pulses.
- For the RLL encoding, an encoder/decoder (Endec) table is used to find the pulse signal to be used for different data bit groups. Endec table used by the IBM to convert bit information to the pulse signal is shown below

DATA BIT	PULSE ENCODING
10	NPNN
11	PNNN
000	NNNPNN
010	PNNPNN
011	NNPNNN
0010	NNPNPNN
0011	NNNNPNNN

- For example, if you want to encode a byte 100011 to proper RLL pulse signal then the
- Bit 10 can be encoded as NPNN
- Bit 0011 can be encoded as NNNNPNNN

**b) What are disk driver? Explain the construction and working of hard disk with diagram.**

Disk Driver

A disk driver is a device driver that allows a specific disk drive to communicate with the remainder of the computer. A good example of this driver is a [floppy disk](#) driver.

Construction of hard disk

Hard disks are rigid platters, composed of a substrate and a magnetic medium. The substrate – the platter’s base material – must be non-magnetic and capable of being machined to a smooth finish. It is made either of aluminium alloy or a mixture of glass and ceramic. To allow data storage, both sides of each platter are coated with a magnetic medium – formerly magnetic oxide, but now, almost exclusively, a layer of metal called a thin-film medium. This stores data in magnetic patterns, with each platter capable of storing a billion or so bits per square inch (bps) of platter surface.

Platters vary in size and hard disk drives come in two form factors, 5.25in or 3.5in. The trend is towards glass technology since this has the better heat resistance properties and allows platters to be made thinner than aluminium ones. The inside of a hard disk drive must be kept as dust-free as the factory where it was built. To eliminate internal contamination, air pressure is equalised via special filters and the platters are hermetically sealed in a case with the interior kept in a partial vacuum. This sealed chamber is often referred to as the head disk assembly (HDA).

Working of hard disk

- When you save a document, it gets written somewhere "non-volatile" that keeps its state even when the power is off. How does that work for a hard drive?
- The hard drive contains a spinning platter with a thin magnetic coating
- A "head" moves over the platter, writing 0's and 1's as tiny areas of magnetic North or South on the platter
- To read the data back, the head goes to the same spot, notices the North and South spots flying by, and so deduces the stored 0's and 1's
- A Modern hard drive can store well over a trillion 0/1 bits per platter, so the individual North/South spots are quite small
- "Flash" storage is made with chips (no moving parts) and is gradually replacing spinning hard drives like this. Flash chips are what's inside camera SDHC memory cards and USB storage keys.

**5 (a) What is keyboard of PC? What is function of it and explain the working principle of keyboard.**

Keyboard

Keyboard is the most common and very popular input device which helps to input data to the computer. The layout of the keyboard is like that of traditional typewriter, although there are some additional keys provided for performing additional functions. Keyboards are of two sizes 84 keys or 101/102 keys, but now keyboards with 104 keys or 108 keys are also available for Windows and Internet.

### Working of keyboard

A keyboard is a lot like a miniature computer. It has its own processor and circuitry that carries information to and from that processor. A large part of this circuitry makes up the key matrix.

The key matrix is a grid of circuits underneath the keys. In all keyboards, each circuit is broken at a point below each key. When you press a key, it presses a switch, completing the circuit and allowing a tiny amount of current to flow through. The mechanical action of the switch causes some vibration, called bounce, which the processor filters out. If you press and hold a key, the processor recognizes it as the equivalent of pressing a key repeatedly.

When the processor finds a circuit that is closed, it compares the location of that circuit on the key matrix to the character map in its read-only memory ([ROM](#)). A character map is basically a comparison chart or lookup table. It tells the processor the position of each key in the matrix and what each keystroke or combination of keystrokes represents. For example, the character map lets the processor know that pressing the "a" key by itself corresponds to a small letter "a," but the Shift and a keys pressed together correspond to a capital "A."

### **(b) Explain common faults of Dot Matrix printer.**

#### Faults of Dot Matrix Printer

1. The output is not high resolution. Color printout is limited and the print speed is also lesser as compared to non-impact printers. Therefore, the quality of print out in general is not very good. This affects the scanner readability of the print out.
2. The printer creates great deal of noise while the pins strike the ribbon to the paper.
3. The pins get bended easily destroying the print head.
4. The single sheet of paper has to wound and aligned by hand which is time-consuming and hectic. This also makes it prone to jamming frequently. Although paper jamming can happen with any printer, fixing it here is not an easy task.
5. The density of barcodes is low and may fail to match user's standards.

### **6 (a) What is DVD? What is its use? Explain the working principle of DVD.**

#### DVD

Short for digital versatile disc or digital video disc, a DVD or DVD-ROM is a [disc](#) capable of storing a significant amount more data than a standard compact disc. DVDs are widely used for storing and viewing movies and other data. The picture of the [Matrix](#) DVD movie disc is an example of a DVD movie. DVD-ROM drives that utilize these discs were first sold in [1997](#).

#### Uses of DVD

Varieties of information can be recorded using optical disks. Whether you are a computer user to backup data or application developer to record software or in entertainment industry (movies), CD/DVDs are simple mediums to distribute any kind of information easily.

These optical disks are preferable because of the following reasons:

- Inexpensive
- Stores a large amount of data
- Easy for handling
- Longevity

#### Working Principal Of DVD.

DVD works on the principle of optical storage media. DVD are of same diameter and thickness as CDs, and they are made using some of the same materials and manufacturing methods. Like a CD, the data on a DVD is encoded in the form of small pits and bumps in the track of the disk.

DVD is composed of several layers of plastic, totalling about 1.2 millimetres thick. Each layer created by injection moulding poly carbonate plastic. This process forms a side that has microscopic bumps arranged as a single. Continuous and extremely long spiral track of data. More on the bumps later. Once the clear pieces of poly carbonate are formed, a thin reflective layer is sputtered onto the disc, covering the bumps. Aluminium is used behind the inner layers and a semi-reflective gold later is used for the outer layer allowing the laser to focus through the other and onto the inner layers.

**(b) Explain the following terms: -**

**(i) Monitor Resolution**

Monitor resolution describes the visual dimensions of any given display. Expressed in terms of width and height, monitor resolution is comprised of a specific number of pixels.

**(ii) Sector inter leaving**

When referring to a computer hard drive, interleaving is a method of making data accessed more efficiently by organizing the sectors on the hard drive.

interleaving is a technique used to improve slow system performance by putting data accessed sequentially into non-sequential blocks, typically [sectors](#). The number of physical sectors between consecutive logical sectors is called the interleave skip factor or skip factor.

Interleaving was used to arrange the sectors most efficiently, so that after reading a sector, time is allowed for processing, and then the next sector in sequence is ready to be read just as the computer is ready to do so. Matching the sector interleave to the processing speed therefore accelerates the data transfer, but an incorrect interleave can make the system perform markedly slower.

Interleaving techniques

One to one = Sectors are placed on a track

Two to one = Sectors are spread out by other sectors.

Computer hard drive help and support.

**7 (a) Explain the working principle of mouse.**

Working of Mouse

The LED installed at the bottom of the mouse emits a bright light in the downward direction. Since a mouse is usually used on plain surfaces, the light bounces back from the surface and enters a photocell that's also mounted on the bottom, almost next to the LED.

This photocell has a frontal lens that magnifies any light reaching it. As you move the mouse around, the pattern of the reflected beam changes; this is then used by the light-detector chip to figure out how and in which direction you're moving the mouse.

**(b) Explain the concept of tape in detail.**

A tape drive is a data storage device that reads and writes data on a magnetic tape. Magnetic tape data storage is typically used for offline, archival data storage. Tape media generally has a favourable unit cost and a long archival stability.

A tape drive provides sequential access storage, unlike a hard disk drive, which provides direct access storage. A disk drive can move to any position on the disk in a few milliseconds, but a tape drive must physically wind tape between reels to read any one particular piece of data. As a result, tape drives have very large average access times.