

# CHAPTER 3

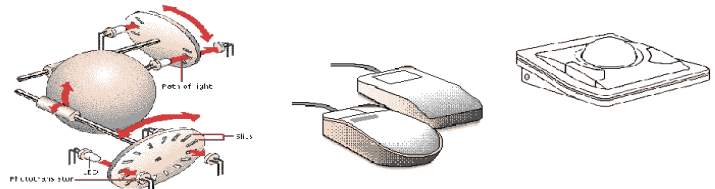
## INPUT/OUTPUT DEVICES

### Q1. Name different categories of input devices?

P1

The devices used to enter data and instructions into the computer are called input devices. Like

- Keyboard
- Mouse, Joystick (Pointing devices)
- Scanner (Scanning Devices).
- Microphone (Voice – input devices.)
- Digital Camera. (Pc-Camera)



### Q2. What is a keyboard? Name the different key categories on the keyboard?

Keyboard is an input device used to enter textual data into the computer. Its layout is like the typewriter. But it contains some extra command keys and function keys. QWERTY and DVorak are most popular keyboard layouts. A keyboard can have 101 to 104 keys.

**Different key categories are as under:-**

- **Alphanumeric Keys:** These keys are used to enter alphabets(upper and lower case), numbers(0 to 9) and other special characters(\$, @, %, +, \*)
- **Numeric Keys:** These keys are used to enter numbers and mathematical operators (+, -, \*, /)
- **Function Keys:** Function keys perform different tasks in different software. These keys provide shortcuts for doing routine tasks. These keys are marked as F1 to F12 and can be used with the combination of CTRL, ALT and SHIFT keys.
- **Cursor Control Keys:** Four cursor control keys are used to move the cursor on the screen in the any direction. These are also used for screen navigation.

### Q3. Name five important keys on a keyboard along with their functions?

**Enter Key:** Used to enter commands, Or to move cursor to the beginning of the next line.

**ESC Key:** Short for Escape, To send special codes to device for exit (or escape) from programs and tasks.

**Delete Key:** To delete a character to the right of the cursor. Also used to delete selected objet.

**CTRL Key:** Perform a command when used with other keys. (CTRL+S to save document)

**SHIFT Key:** To change lower case letters to capitals and vice versa.

**ALT Keys:** ASCII code can be entered using the ALTErnate key.

**Home Key:** To move the cursor to the first character in the line.

**End Key:** moves the cursor to the end of the line.

**Page UP:** To move the cursor to the previous page.

**Page Down:** To move the cursor to the next page.



### Q4. What is voice recognition software? Explain.

Translating voice to text is known as voice recognition. With the help of Microphone a voice-recognition system gets input and then converts it into digital data by comparing with prerecorded speech patterns stored in the computer.

Voice recognition may be used to dictate text to the computer or to give commands to the computer such as opening application programs, pulling down menus or saving work.

### Q5. Define scanners?

Scanner is an input device. It is capable of reading the image and can transfer it into the computer. The transferred information is in the form of graphic image or picture and not in the form of text. Optical Character Recognition (OCR) software is used to convert image of text into actual text.

There are two types of scanners.

- Monochrome scanners
- Color scanners: are capable of scanning a whole page at once.



**Q6. What is monitor? Differentiate between monochrome and color monitors?**

The monitor is the most commonly used output device. It is also called a screen. The quality of the image depends upon the resolution. Number of pixels on the screen is called resolution, known as a matrix. Some resolutions are (640 by 480 OR 800 by 600 or 1024 by 768 pixels)

**Monochrome (Black & White):** These monitors can display only one color. (Such as green, amber or white) against a contrasting background, usually black. These monitors can display text only and are not used for displaying graphics.

**Color Monitors:** Color monitors can display the combinations of red, green and blue (RGB) colors. These three are the basic colors and their combination can display a full range of colors.

**Q7. Define (a). Flat Panel Display (b). Liquid Panel Display**

**a). Flat Panel Display:** Flat panel monitors are usually used with portable and laptops because of its small size. These are expensive and do not provide the high quality and bright colors.

**(b). Liquid Panel Display:** LCD monitors create images with a special kind of liquid crystal that is normally transparent but becomes opaque when charged with electricity. If you have a handheld calculator or a digital watch, it probably uses a liquid crystal display.

**Q8. Write a note on different kind of printers.**

There are two kinds of printers: 1). Impact printers 2). Non-Impact printers

**a): Impact printers:** works like the typewriter. These printers produce images on paper by striking on inked ribbon with a hammer (or set of pins). They are cheap, slow and noisy. Some Impact printers are as follow.

a). Dot Matrix b). Daisy Wheel c). Line Printers

**b. Non-Impact Printers:** These printers produce images and text without striking the paper. These are less noisy, have fine quality and fast printing speed. Some non-impact printers are as follow.

a). Electrostatic b). Electro thermal c). Ink jet d). Laser printers

**Q9. What is a plotter?**

A plotter is a special printing device, used to produce high quality graphics output with automatic pens. It can draw continuous point-to-point lines directly from the graphics files. Plotters can also produce maps, bar charts, engineering drawings, and even two or three-dimensional graphics.

There are three basic types of plotters.

a). Drum plotters b). Flatbed plotters c). Electrostatic plotters.

**Q10. What is difference between soft copy and hard copy?**

**a). Soft copy:** An electronic version of a document stored on storage device is called **Soft copy**

**b). Hard copy:** Printed version of an electronic document (on a paper) is called **Hard Copy**.



# GENERAL QUESTIONS

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**Define Output devices:** The devices, which are used to receive data and information from the computer, are called output devices. Most common output devices are Monitor, printer and speaker etc

**1. What is Mouse?:** A mouse is an input device. It is a pointing device used to select various options with two or three buttons. As mouse is moved it guides a small pointer on the screen. It is also used to draw pictures and to edit text. Scroll and Optical mouse getting popular in these days.

Optical mouse uses light reflection to control the pointer.

**2. Write different mouse events:** (Activities Performed By The Mouse)

There are three mouse events:

**1). Left Click:** is used select graphical objects, text, icons, and to open, close, minimize or maximize the windows.

**2. Right Click:** is used to view the properties of an object such as file, folder and desktop etc.

**3. Drag:** is keep on pressing the left mouse button while moving the mouse. It is used to select more than one item and to drop objects into another folder/application.

**3. What is a Trackball?:** A trackball is a pointing device almost like a mouse. The user controls the cursor on the screen by rolling a ball with the fingertip or wrist. To execute commands with a trackball, one or more buttons are pressed such as with a mouse. A Trackball is stationary and can be placed on any type of surface.

**4. What is a Joystick?:** It is an input device. It is used to control the movement of an object on the screen. It is mostly used in games and computer aided designs. It is like a lever that can move in any directions like left, right, forward, backward, etc. Most joysticks include two buttons called triggers.

**5. What is Microphone?:** Microphone is an input device used to record audio data. Many applications can accept input via a microphone, enabling the user to dictate text or issue commands orally.

**6. What is Electric Light Pen?:** It is a light-sensitive input device. It allows the user to interact directly with the computer screen. It gives the user full range of mouse capabilities of drawings, menu selecting, drag & dropping or highlighting etc. Light pen offers more active and accurate interaction between the user and the computer system.

**7. What is digital Camera?:** It is an input device used to store images digitally in its memory. Then pictures can be downloaded to a computer system for further processing. It provides us cheap and fast method of photography. Normal Camera uses film while the Digital Camera uses a charged-coupled device (CCD).

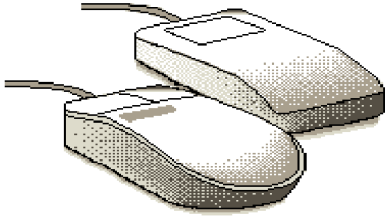
**8. What is a disk drive:** Disk drive is a machine that reads and writes data onto a disk. Disk drive rotates the disk and it has one or more read/write heads. There are different types of disk drives like *Hard Disk Drive (HDD)*, *Floppy Disk Drive (FDD)*, *Magnetic Disk Drive*, and an *Optical Disk Drive* to read optical disk.

**9. What is video controller?:** It is a device that controls the resolution of the monitor. Resolution is the quality of images that a monitor can display. It contains memory and circuitry necessary to send information to the monitor. Video Graphic Array (VGA Card) has resolution 640 x 480 pixels, while the SVGA has resolution upto 1024x768 pixels.

- 10. What is Printer?:** A printer is an output device that produces hardcopy on the paper. Printers are commonly used to print out the documents on paper. There are basically two types of printers
- a). Impact printers (Dot-matrix, Daisy Wheel and Line printers)
  - b). Non-Impact printers (Laser, Ink Jet, Electro-Thermal and Electrostatic printer,)
- 11. Dot-Matrix Printer:** It works like typewriter. It produces images and text with striking the dots on paper. These printers are expensive and do not produce high quality output, however they can print multiple copies of page at a time.
- 12. Daisy-wheel Printer:** Characters are etched at the outer edge of a wheel, which forms characters. These printers are loud and slow. They can't print graphics, and can't change fonts unless the print wheel is physically replaced.
- 13. Line printer:** These printers can print multiple characters at the same line. Line printers have printing speed from 300 lines per minute to 2400 LPM. These are much faster than Dot Matrix and Daisy-Wheel printers. However these are loud, have limited font capability and lower print quality. Line printers use special papers with pre-punched holes along each side, which help to print at very high speed.
- 14. Laser Printer:** Laser stands for (Light Amplification by Stimulated Emission of Radiation). They use laser beams to burn special ink called toner on the page to create a permanent image. They create high quality output at a very fast speed, without making too much noise. These are the fastest printers, which can print more than 12 pages per minute.
- 15. Electro-Thermal printer:** It uses heated pins to "burn" images onto heat-sensitive paper. This printing mechanism is used in calculators and in fax machines. These printers are inexpensive, fast and produce low-resolution prints.
- 16. Electrostatics printers:** It uses a special photographic paper that allows characters to be etched onto the paper using a stylus. These printers can be used for both printing and plotting (displaying graphic output), and can print more than 5000 lines per minute.
- 17. Ink jet printer:** It prints by spraying electrically charged ink on a paper. Ink-jet printers are capable to produce high quality colored printing. It provides resolution upto 300 dots per inch. However it is cheap, slow and require a special type of ink.
- 18. Drum Plotter:** It uses a pen and a drum. The paper is wrapped onto the drum that rotates back and forth. To produce an image the pen moves horizontally, while the paper moves vertically. In this way it creates the required design. Colored pens can be used to produce colored output.
- 20. Flatbed Plotter:** Flatbed plotters use two arms holding colored ink pens. The two arms operate at right angle as they draw on a stationary piece of paper. These are very slow and can take hours to print a complicated drawing.
- 21. Electrostatic plotter:** These plotters draw on negatively charged paper with positively charge toner. They are most frequently used for CAE (computer-Aided Engineering) applications, such as CAD (Computer-Aided Design) and CAM (Computer-Aided Manufacturing).
- 22. Compact Disk-Recorder/ Re-Writer (CD-R/ CD-RW):**
- A CD-Writer is a drive that allows you to save data to a CD-R disk. A CD-R disk will hold a maximum of 700 megabytes of data or 80 minutes of digital audio or video. A CD-R disk can be written once and can't be deleted or changed.
- CD-RW Drives can use both CD\_R and CD-RW disks. On CD-Rewriter data can be erased and new data can be written again. We can rewrite information on a CD-RW disc upto 1000 times.

# Mouse (computer)

## I INTRODUCTION



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### Mouse

A mouse is a pointing device that helps a user navigate through a graphical computer interface. Connected to the computer by a cable, it is generally mapped so that an on-screen cursor may be controlled by moving the mouse across a flat surface. Two common types of mouse, the Microsoft mouse (bottom) and the Apple ADB (Apple Desktop Bus) mouse (top) are shown here.

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Mouse (computer), common pointing device used with personal computers that have a graphical user interface (GUI). A user typically operates a mouse with one hand in order to move a cursor over images or text on a computer screen. Clicking buttons on the mouse activates, opens, or moves icons or other graphical objects on the screen when they are displayed under the floating cursor. Another type of pointing device called a joystick is typically used for interacting with computer games.

A mouse is commonly attached to a personal computer by a cord that connects to a universal serial bus (USB) port. The rectangular USB interface allows the mouse to report its position at a very high rate. Other types of interfaces include a PS/2 port, which uses a smaller, round connector and reports the mouse's position at a lower rate. The PS/2 port is a dedicated mouse port built into the motherboard of the computer. Earlier personal computers often had a serial mouse that connected to the computer through a standard serial port of the type that could also be used for other purposes, such as attaching a modem. Early types of bus mice attached to the computer's bus through a special card or port.

The basic features of a mouse are a casing with a flat bottom, designed to be gripped by one hand; one or more buttons on the top; a multidirectional detection device on the bottom; and a cable connecting the mouse to the computer. By moving the mouse on a surface (such as a desk), the user typically controls an on-screen cursor. A mouse is a relative pointing device because there are no defined limits to the mouse's movement and because its placement on a surface does not map directly to a specific screen location. To select items or choose commands on the screen, the user presses one of the mouse's buttons, producing a "mouse click."

Most computer mice now have a small vertical wheel between two buttons to allow easy scrolling up and down a screen. Left-handed people can also reprogram a mouse to switch functions assigned to the right and left buttons.

## II TYPES OF COMPUTER MICE

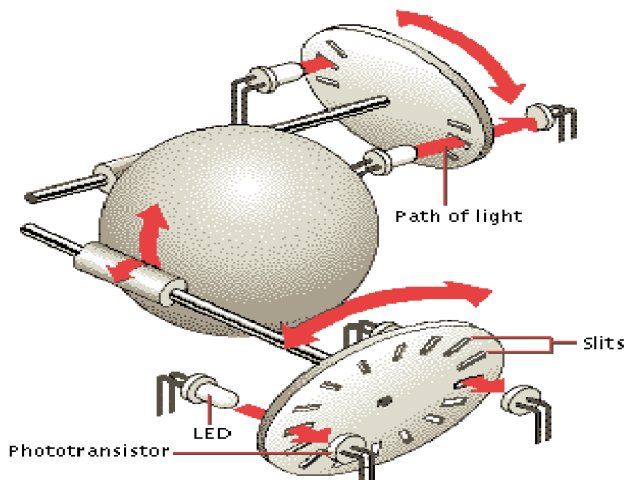
### A Mechanical Mouse

A mechanical mouse translates the motion of a ball on the bottom of the mouse into directional signals. As the user moves the mouse, the ball typically spins a pair of wheels inside the mouse. These conductive wheels might, in turn, rotate additional wheels via axles or gears. At least one pair of wheels has conductive markings on their surface. Because the markings permit an electric current to flow, a set of conductive brushes that ride on the surface of the conductive wheels can detect the conductive markings. The electronics in the mouse translate these electrical-movement signals into mouse-movement information that can be used by the computer.

### B Optical Mouse

An optical mouse uses a light-emitting diode (LED) and a small CCD (charge coupled device) camera to detect motion. Modern optical mice can work on virtually any surface. The early designs for optical mice used two lights of different colors, and a special mouse pad that had a grid of lines in the same two colors, one color for vertical lines and another for horizontal lines.

### C Optomechanical Mouse



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#### Optomechanical Mouse

As a mouse is moved, a ball in the mouse's interior is rolled. This motion turns two axes, corresponding to the two dimensions of movement. Each axle spins a slotted wheel. On one side of each wheel, a light-emitting diode (LED) sends a path of light through the slots to a receiving phototransistor on the other side. The pattern of light to dark is then translated to an electrical signal, which reports the mouse's position and speed and is reflected in the movement of the cursor on the computer's screen.

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An optomechanical mouse translates motion into directional signals through a combination of optical and mechanical means. The optical portion includes pairs of light-emitting diodes (LEDs) and matching sensors; the mechanical portion consists of rotating wheels with cutout slits. When the mouse is moved, the wheels turn and the light from the LEDs either passes through the slits and strikes a light sensor or is blocked by the solid portions of the wheels. These changes in light contact are detected by the pairs of sensors and interpreted as indications of movement. Because the sensors are slightly out of phase with one another, the direction of movement is determined by which sensor is the first to regain light contact. Because it uses optical equipment instead of mechanical parts, an optomechanical mouse eliminates the need for many of the wear-related repairs and maintenance necessary with purely mechanical mice.

## D Cordless Mouse

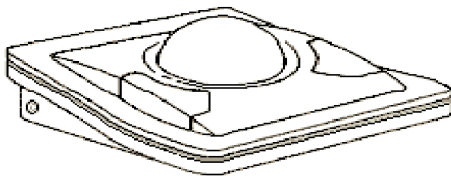
A cordless or wireless mouse uses a radio or an infrared broadcasting system to link the mouse to the computer. Such a mouse typically needs batteries for power.

## E Touch Pad and TrackPoint

A standard external mouse that is physically independent of a computer is not practical for use with laptops or other portable computers. A touch pad (also called a trackpad or a glidepoint) usually takes the place of a mouse. The user drags a finger across the flat surface of the touchpad, causing the cursor to move in the corresponding direction. Two buttons allow the user to click on icons similar to a standard mouse. An earlier system that used the "J" key on the keyboard as a mouse substitute is considered obsolete.

Another pointing device that can be used with some portable computers is TrackPoint, introduced by IBM in 1992. Also called a pointing stick, the small rubber cap sits on the keyboard above the B key and between the G and H keys and can be clicked and double-clicked.

## III ERGONOMIC ISSUES



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#### Trackball

A trackball is basically an inverted mouse; the user rotates the ball itself while clicking nearby buttons. Trackball users argue the device is more efficient because it is stationary and saves arm movement; however, many mouse users are uncomfortable with the different style of input.

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The restricted and repetitive hand movements required to move a mouse and click buttons for long periods of time may cause fatigue or painful repetitive stress injuries (RSI) to arms, wrists, and hands such as carpal tunnel syndrome or “mouse elbow.” Special ergonomically designed mice that allow different types of grips or hand and finger movements are available. Another alternative is a trackball, which functions like an upside-down mouse. Users can rotate the trackball with a thumb or finger to move the cursor. Less wrist and arm movement is needed. A foot mouse is a specialized alternative that allows users to use feet rather than hands to move a cursor.

## IV HISTORY



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### Apple Macintosh Computer

The Apple Macintosh, released in 1984, was among the first personal computers to use a graphical user interface. A graphical user interface enables computer users to easily execute commands by clicking on pictures, words, or icons with a pointing device called a mouse.

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The first computer mouse was developed by Douglas Engelbart in 1964 at the Stanford Research Institute (SRI), where he headed a team that researched ways for people to interact with computers. The mouse allowed a user to rapidly perform computer tasks by simple hand actions instead of typing complicated strings of characters or code. The device was demonstrated in public in 1968 and granted a patent in 1970. It used two perpendicular rolling wheels to translate movements by the user into vertical and horizontal motion on a screen. The name “mouse” was said to be inspired by the long cord attached to the box-like device, which resembled a tail. By 1973 the basic mouse design had replaced the original wheels with a moving ball.

Xerox Corporation used a mouse and graphical user interface with its early experimental Alto personal computer developed at its Palo Alto Research Center (PARC) in 1980. Apple developed a much more reliable and practical computer mouse for its highly successful Macintosh computer, introduced in 1984. Microsoft had provided a mouse for MS-DOS with some of its software as early as 1983, but it was not until the company's Windows graphical-user-interface software became available in 1985 that an improved Microsoft mouse became standard. The computer mouse can also be used with versions of the UNIX, Linux, and OS/2 operating systems.



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