COMPUTER PERIPHERALS

Computer hardware refers to the physical parts or components of a computer such as monitor, keyboard, computer data storage, hard drive disk, mouse, system unit (graphic cards, sound cards, memory, mother board and chips), etc. all of which you can actually touch. C**omputer hardware** is the physical components (**devices)**, which are the building blocks of personal computers. These are installed into a computer case, or attached to it by a cable or through a port. In the latter case, they are also referred to as **peripherals**. A combination of hardware and software forms a usable computing system.

Input / Output (I/O) Devices:

These devices are used to enter information and instructions into a computer for storage or processing and to deliver the processed data to a user. **I/O** devices are required for users to communicate with the computer. In simple terms, input devices bring information **INTO** the computer and output devices bring information **OUT** of a computer system. These **I/O** devices are also known as peripherals since they surround the CPU and memory of a computer system. Computer **Peripherals divides** in to the following categories based on their usage:

Input Devices:

An input device is any device that provides input to a computer. There are many input devices, but the two most common ones are a keyboard and mouse. Every key you press on the keyboard and every movement or click you make with the mouse sends a specific input signal to the computer.

Examples: Keyboard, Mouse, Image Scanner, Digital Camera, Webcam, Joy stick, Trackball, Touchpad, Touch Screen, Light Pen, Bar code reader, Microphone,

Graphics tablet, Magnetic ink character recognition (MICR), Optical mark recognition (OMR), etc.

1. **Keyboard:** The keyboard is very much like a standard typewriter keyboard with a few additional keys. The basic QWERTY layout of characters is maintained to make it easy to use the system. The additional keys are included to perform certain special functions. These are known as function keys that vary in number from keyboard to keyboard.

Note: Number of organisations are manufacturing Key Boards for PCs, among which Sony, Samsung, Zebronics, Amkette are famous.

2. **Mouse:** A device that controls the movement of the cursor or pointer on a display screen. A mouse is a small object you can roll along a hard and flat surface**.** Its name is derived from its shape, which looks a bit like a mouse. As you move the mouse, the pointer on the display screen moves in the same direction. The figure of ZEB-M07 PS2 Wired Mouse shown here.

Note: Quite a few organisations are manufacturing Mouse for PCs, among which Sony, Samsung, Zebronics, Amkette are some of the famous companies.

3. **Scanner:** Scanner is an input device that can read text or illustration printed on paper and translates the information into a form that the computer can use. A scanner works by digitizing an image. The figure of **Canon CanoScan 5600F**

shown here.

Note: Number of organisations are manufacturing scanners for PCs, among which Sony, Samsung, Zebronics and Canon are famous.

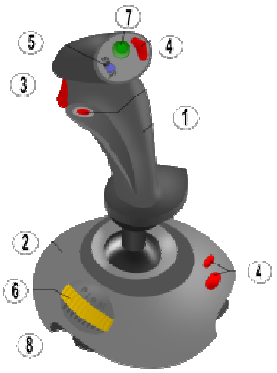
4. **Digital Camera:** A **digital camera** or **digicam** is used as input device that encodes digital images and videos digitally and stores in a computer them for later reproduction. Figure of Canon Powershot A2500 Digital Camera 16MP, 4x Zoom shown below

Note: Number of organisations are manufacturing Digital Cameras among which Sony, Samsung, Canon are some of the famous companies.

5. **Web Camera (Soft Cam):** A **webcam** used as input device which uses a video camera that feeds its image in real time to a computer. A webcam is generally connected by a USB cable, FireWire cable, or similar cable. Their most popular use is the establishment of video links, permitting computers to act as videophones or videoconference stations. The common use as a video camera for the World Wide Web gave the webcam its name. Other popular uses include security surveillance, computer vision, video broadcasting, and for recording social videos.

Note: Number of organisations are manufacturing Webcams, among which Sony, Samsung, Zebronics, Creative are some.

6. **Joysticks:** A joystick is an input device consisting of a stick that pivots on a base and reports its angle or direction to the device it



is controlling. Joysticks are often used to control video games, and usually have one or more push-buttons whose state can also be read by the computer. Figure of Joystick is shown here with description of Buttons.

Video game joystick elements: 1. Stick, **2.** Base, **3.** Trigger, **4.** Extra buttons, **5.** Auto fire switch, **6.** Throttle, **7.** Hat switch (POV Hat), **8.** Suction cup.

Note: Number of organisations are manufacturing Joysticks, among which Sony, Zebronics, Creative are well-known.

7. **Trackball:** A trackball is an input device used to enter motion data into computers

or other electronic devices. It serves the same purpose as a mouse, but is designed with a moveable ball on the top, which can be rolled in any direction. The figure of trackball shown here. The Kensington Expert Mouse can use a standard American pool ball as a trackball.

Note: Number of organisations are manufacturing Trackball, among which Sony, Zebronics, Creative are famous ones.

8. **Touchpad:** A touch pad is a device for pointing (Controlling Input Positioning) on a computer display screen. It is an alternative to Mouse. Originally incorporated in laptop computers, touch pads are also being made for use with desktop computers. A touch pad works by sensing the user's finger movement and downward pressure.

9. **Touch Screen:** It allows the user to operate/make selections by simply touching

the display screen. A display screen that is sensitive to the touch of a

finger or stylus. Widely used on ATM machines, retail point-of-sale terminals, car navigation systems, medical monitors and industrial control panels. Apple iPad, a tablet computer with a touch screen shown here.

10. Light Pen: Light pen is an input device that utilizes a light-sensitive detector to select objects on a display screen.

11. Bar code reader: Bar-code readers are photoelectric scanners that read the bar codes or vertical zebra stripes marks, printed on product containers. These devices are generally used in super markets, bookshops etc. Example for Bar code reader figure shown here. (A handheld canon barcode scanner).

Note: Number of organisations are manufacturing Barcode Scanners, among which Zebronics, Creative are some.

12. Micro Phone: Micro Phone is also used as input device to store Sound/noise into the computer. All of the different noises we hear are caused by minute pressure differences in the air around us. A **microphone** transducer or sensor that converts sound into an electrical signal and helps to stored into the Computers. An AKG Perception 120 USB condenser microphone.

13. Graphics Tablets: A **Graphics Tablet** or **Digitizer** is a computer input device that enables a user to hand-draw images, animations and graphics, similar to the way a person draws images with a pencil and paper. These tablets may also be used to capture data or handwritten signatures. It can also be

used to trace an image from a piece of paper which is taped or otherwise secured to the surface. Capturing data in this way, either by tracing or entering the corners of linear poly-lines or shapes is called digitizing. The figure of Wacom Bamboo Capture tablet and pen shown here.

14. Magnetic ink character recognition (MICR) :

Magnetic ink character recognition (MICR) is an input device functions on character recognition technology used mainly by the banking industry to ease the processing and clearance of cheques and other documents. The MICR encoding called the *MICR line*, is at the bottom of cheques and other vouchers and typically includes the document-type indicator, bank code, bank account number, cheque number, cheque amount, and a control indicator. This device particularly finds applications in banking industry.

15. Optical Mark Recognition (OMR): Optical Mark Recognition, also called mark sense reader is a technology where an OMR device senses the presence or absence of a mark, such as pencil mark. OMR is widely used in tests such as aptitude test.

BIOMETRIC DEVICES

Output Devices:

Output devices bring information OUT of a computer system. These output devices are also known as peripherals since they surround the CPU and memory of a computer system.

Examples: Monitor, printer, projector, plotter, Speaker (loudspeaker).

16. Monitor: A **monitor** or a **display** is an electronic visual display unit for computers. The display device in modern monitors is typically a thin film transistor liquid crystal display (TFT-LCD) thin panel, while older monitors use a cathode ray tube (CRT) about as deep as the screen size. In computers, a monitor is a computer display and related parts packaged in a physical unit that is separate from other parts of the computer. Figure of A 19 in (48 cm), 16:10 widescreen LG LCD monitor shown here.

Note: Number of organisations are manufacturing Monitor's for PC among which Sony, Samsung, LG, HP, HCL are famous

17. Printer: In computers, a printer is a device that accepts text and graphic as output from a computer and transfers the information to paper, usually to standard size sheets of paper. Printers vary in size, speed, sophistication, and cost. In general, more expensive printers are used for higher-resolution color printing. Printers can also be categorized based on the print method or print technology. The most popular ones are **dot-matrix printer, laser printer, inkjet printer and Multi Function Printers (MFP) / All-in-One Printers**. Among these, only dot-matrix printer is impact printer and the others are non-impact printers.

Dot-matrix printer: Dot-matrix printer is an impact printer that produces text and graphics when tiny wire pins on the print head strike the ink ribbon. The print head runs back and forth on the paper like a typewriter. When the ink ribbon presses on the paper, it creates dots that form text and

images. Higher number of pins means that the printer prints more dots per character, thus resulting in higher print quality. Dot-matrix printers were very popular and the most common type of printer for personal computer in 70's to 80's. However, their use was gradually replaced by inkjet printers in 90's. As of today, dot matrix printers are only used in some point-of-sales terminals, or businesses where printing of carbon copy multi-part forms or data logging are needed. Figure of Dot Matrix Printer of Epson FX-875 Model shown here.

Laser printer: Laser Printers are non-impact printers which can print text and images in high speed and high quality resolution, ranging from 600 to 1200 dpi. Laser printer use toner (black or colored powder) instead of liquid inks. A laser printer consists of these major components: drum cartridge, rotating mirror, toner cartridge and roller. The drum cartridge rotates as the paper is fed through. As the drum rotates and presses on paper, toner is transferred from the drum to paper, creating images. Rollers then use heat and pressure to fuse toner to paper. Colored laser printers add colored toner. In following Mono (Black/White) laser printer of Samsung Model of ML-2165W/XAA is shown here.

Inkjet Printer: Inkjet printers are non-impact printers which print text and images by spraying tiny droplets of liquid ink onto paper. They are the most popular printers for home use. Currently, most inkjet printers use either thermal inkjet or piezoelectric inkjet technology. Thermal inkjet printer uses heating element to heat liquid ink to form vapor bubble, which

forces the ink droplets onto the paper through the nozzle. Most inkjet manufacturers use this technology in consumer inkjet printers. In following figure Canon PIXMA - iP2770 Single Function Inkjet Printer is shown.

Multi Function / All-in-One Printers (MFP): It is also known as all-in-one printer or multifunction device (MFD). It is a machine that includes several functionalities including printer, scanner, copier and fax.

Multifunction printer is very popular in So **Ho (small office / home office)** offices. It can use either inkjet or laser print method. Some multifunction printers also have media card readers, allowing printing of pictures directly from digital cameras without using a computer. In the following figure we shown model of Samsung SCX-6320F Multi-functional Laser Printer.

Note: Number of organisations are manufacturing different types of printers and Samsung, Epson, HP. Xerox, TVS, Wipro are some of the well-known famous manufacturers among them.

18. **Projector or Video Projector:** Video Projector is an image projector that receives a video signal and projects the corresponding image on a projection screen using a lens system. All video projectors use a very bright light to project the image, a video projector, also known as a digital projector, may project onto a traditional reflective projection screen, or it may be built into a cabinet with a translucent rear-projection screen to form a single unified display device.

19. **Plotter**: A device that draws pictures on paper based on commands from a

computer. Plotters differ from printers in that they draw lines using a pen. As a result, they can produce continuous lines, whereas printers can only simulate lines by printing a closely spaced series of dots. Multicolor plotters use different-colored pens to draw different colors. In general, plotters are considerably more expensive than printers.

20. Speaker: A **loudspeaker** is an electro acoustic transducer that produces sound in response to an electrical audio signal input. the term "loudspeaker" may refer to individual transducers (known as "drivers") or to complete speaker systems consisting of an enclosure including one or more drivers. To adequately reproduce a wide range of frequencies, most loudspeaker systems employ more than one driver, particularly for higher sound pressure level or maximum accuracy. Individual drivers are used to reproduce different frequency ranges. The drivers are named subwoofers (for very low frequencies); woofers (low frequencies); mid-range speakers (middle frequencies); tweeters (high frequencies).

Both:

Here some of the devices like Floppy disk drive, hard disk drive, optical disc drive, Flash Drive (Discussed in earlier) are used as both I / O devices.

MODEL QUESTIONS

1. **Personal computer hardware** are-------- components. (**physical**)
2. A Power Supply Unit converts alternating current (AC) into low-voltage **DC power**.
3. ---------- is a circuit board that allows the CPU to interact with other parts of the computer (**Motherboard**)
4. ---------- is used to store information. (**Memory)**

5. CPU or Processor is the ---------- of any computer. **(brain)**
6. There are two memory types – One is RAM and another is **ROM.**
7. RAM is ---------- (non-permanent). **(volatile memory)**
8. DRAM (Dynamic RAM) is similar to a **capacitor.**
9. SRAM (Static RAM) is used as ---------- memory. **(CACHE)**
10. DDR has doubles the rate of data transfer of standard **SDRAM**
11. ROM can be programmed using a programmer and then it acts as a ---------- device. **(read only)**
12. Floppy drives replace ---------- flash drive is re-writable and holds memory without a power supply. **(Flash drive)**
13. ---------- is a computer hardware component that connects computer to a computer network. **(Network Card)**
14. --------- sometimes called a mouse port, was developed by IBM **(PS/2 PORT)**
15. ----------devices are required for users to communicate with the computer. **(Input / Output)**

SK. Faiz Ahmed, M.Tech. Ph.D.,
Computer Science Faculty, Nellore.