Q.42 Write a note on speakers.

Answer

Speakers

    Speakers are audio output devices that are attached to the sound card on motherboard. Speakers produce softcopy output in the form of voice. Speakers are available in different shapes and sizes as shown in Fig. 1.30

Fig. 1.30 Speakers

KEY POINTS

☞ A computer is a device, which takes instructions and data in the form of input, performs computations according to the given instructions and provides output as a result. All machines, components or devices that mediate in the processing of a computer system are called computer devices.

☞ Computers are classified into Microcomputer, Minicomputer, Mainframe and supercomputer. Microcomputers are the smallest and the least expensive computers, whereas, Supercomputers are the largest, the most expensive and powerful computers.

☞ The physical components of a computer such as monitor, keyboard and hard disk are known as hardware.

☞ System software is a collection of programs to make the use of computer easy, efficient and effective.

☞ Application software is a set of programs designed to perform a particular task.

☞ Firmware is an intermediate form between hardware and software which consists of software embedded in electronic devices during their manufacture.

☞ Input devices are used to communicate with the computer. They accept data and instructions from the user and convert them into machine readable form before storing in the computer memory.

☞ Output devices consist of peripheral devices that transfer information from the main memory to the outside world in human readable form.

☞ Hardcopy is the output generated on paper by an output device such as printer or plotter.

☞ Softcopy is data or information stored on a storage device or displayed on a monitor.

EXERCISE

Q.1 Select the best answer for the following MCQs.

i. _____ of the following is the smallest computer.
    A. Mainframe   B. Minicomputer   C. Microcomputer   D. Supercomputer

ii. How many instructions per second a minicomputer can execute?
    A. Thousands of instructions   B. Millions of instructions
    C. Billions of instructions   D. Above trillion instructions

iii. What type of software MS Word is?
    A. System software   B. Application software
    C. Utility software   D. Language processor

iv. _____ device is most suitable for playing games.
    A. Mouse   B. Keyboard   C. Joystick   D. Light pen

v. Which of the following is an impact printer?
    A. Dot matrix printer   B. Laser printer   B. Ink jet printer   D. Plotter

vi. _____ software controls the operation of a hardware device.
    A. Utility software   B. Language processor
    C. Application software   D. Device driver

vii. Which of the following devices is used to print large size hardcopy?
    A. Plotter   B. InkJet printer   C. Laser printer   D. Chain printer

viii. Which of the following devices converts spoken words into electrical form?
    A. Touch pad   B. Microphone   C. Scanner   D. Digital Camera

ix. _____ software converts computer programs to machine language.
    A. Utility program   B. Device driver
    C. Language processor   D. Application software

x. Which of the following is productivity software?
    A. Spreadsheet software   B. Utility software
    C. Windows 7   D. Compiler

Answers

i.	C	II.	C	III.	B	Iv.	C	v.	A
vi.	D	vii.	A	viii.	B	Ix.	C	x.	A

Q.2   Write short answers of the following questions.

i. Give important characteristics of computers.

Answer

The following are some of the main characteristics of computers:

1. Speed

Speed is one of the main characteristic of a computer. A computer can perform billions of calculations in a second. The speed of a computer is measured in Mega Hertz (MHz) or Gega Hertz (GHz)

2. Accuracy

Computers can perform operations and process data faster but with accurate results and no errors. Results can be wrong only if incorrect data is fed to the computer or a bug may be the cause of an error.

3. Storing Data

Storage capacity is another big characteristic of a computer. A computer can store large amount of data. This data can be used at any time and from any location. The storage capacity of a computer is measured in mega byte (MB), gega byte (GB), tera byte (TB).

4. Versatility

Computer is a versatile machine. They are used in various fields. They are used in schools and colleges, at hospitals, at government organizations and at home for entertainment and work purposes.

5. Communication

Computers have the ability to communicate, but of course there needs some sort of connection (either Wired or Wireless connection). Two computers can be connected to send and receive data. Special softwares are used for text and video chat. Friends and family can connect over the Internet and share files, photos and videos online.

6. Multitasking

Multitasking is also a computer characteristic. Computers can perform several tasks at a time. For example you can listen to songs, download movies, and prepare word documents all at the same time.

7. No Intelligence

Computers do not have any intelligence of their own. They follow a set of instructions fed into them

by manufacturer. The user knows what to do and when to perform a specific task.

ii. Compare microcomputer with mainframe computer.

Answer

Comparison of microcomputer with mainframe computer:

Microcomputer	Mainframe computer
A microcomputer is a computer whose CPU is a microprocessor. A microprocessor is a processor whose all components are on a single integrated-circuit chip. Those are normally single-microprocessor, single-user systems designed for performing basic operations like educational, training, small business applications, playing games etc.	Mainframe computers are designed to handle huge volumes of data and information. These can support more than hundred users at same time. These very large and expensive computers have great processing speeds and very large storage capacity and memory as compared to minicomputers. These computers even possess and work with more than one processor at the same time. Thus, one can say these are multiuser, multiprocessor systems. For mainframe computers very sophisticated operating systems are needed to control and supervise their operation.

iii. Give few application areas of supercomputers.

Answer

Applications of supercomputers

1. Supercomputers are also used in nuclear research and weather forecasting, which requires huge amount of calculations to be performed at high speed.
2. In Pakistan, supercomputers are used in many organizations, like Atomic Energy Research Centre

iv. Name few organizations of Pakistan where Supercomputers are used.

Answer

Following are the names of few organizations of Pakistan where Supercomputers are used:

1. Pakistan Atomic Energy Commission
2. Kahuta Research Laboratories
3. Quaid-e-Azam University

v. How barcode system works in a shopping mall?

Answer

In barcode system, barcodes contain information about the product like name of the product, company, manufacturing date, expiry date, etc.. This information is provided to the computer for further processing like generating bills at checkouts in shopping malls.

vi. Differentiate between computer hardware and software.

Answer

Difference between computer hardware and software:

	Computer Hardware	Computer Software
Definition of	Physical devices used to store and execute various softwares	Set of instructions that enable a user to interact with the computer. It enables the computer to perform a specific task.
Examples of	Monitor, CPU, Keyboard, Mouse, CD-ROM, Pen Drives, Printer, Scanners, Modem, etc..	Microsoft Word , Microsoft Excel, Acrobat Readers, Window XP, etc
Types of	Input devices, Output devices, Storage devices,	System software, Programming

	Processing devices and Control devices	software and Application Software
Function of	Hardware acts as the delivery system for software solutions. Once installed, hardware is not required to be changed on day to day basis.	Software is used to perform the specific task. Although software is generally not needed to be amended on day to day basis, but data is regularly feed for certain software. New versions are released for software with the passage of time.
Reliability of	Hardware are reliable and no bugs are usually noticed in its life time.	Software needs constant testing and any deficiencies / bugs noticed are to be fixed with the passage of time.
Chances of Failure	Hardware failure is random. As the hardware becomes older, the chance of failure increases	Software failure is systematic. With the passage of time and fixing of bugs, software have lesser chances of failure.

vii. Differentiate between system software and application software.

Answer

Difference between system software and application software:

System software	Application software
System software is a collection of system programs that control and coordinate the activities of a computer system System software consists of a collection of operative programs required to control computer hardware and also to execute application software.	Application software is a set of programs designed to perform a specific task.

viii. Define licensed software.

Answer

Licensed software

A software license is a legal agreement that specifies the terms of use for a computer program. It defines the rights of the software developer and the user. When a person purchases software, he is allowed to use the software, which means he is not the owner of the software. Generally all the system software and application software is licensed.

ix. Differentiate between shareware and freeware.

Answer

Difference between shareware and freeware:

Shareware	Freeware
Shareware is given to people free of charge for a limited time period After the expiry time, this software should be purchased for further usage. Shareware is a trial version and its functionality is limited. There are some types of shareware, which are available as full version but they stop working at the end of trial period. The trial period is usually 30 or 60 days Some shareware can be downloaded from Internet.	Freeware is available for use, free of cost. It is usually full version of the software for an unlimited period. This software may have restrictions in term of use. For example, it may be allowed for personal or academic use only or for non-profit use.

x. **Briefly describe magnetic stripe card.**

Answer

Magnetic Stripe Card

Magnetic stripe card has a magnetic stripe, which is used to store data in the form of tiny magnetized and non-magnetized particles of magnetic material. The information on the card is read by swiping the card past a magnetic reading head. Examples of these cards include credit cards, ATM cards, VISA and MasterCard, driver's license and membership cards.

xi. **Give any five advantages of using LCD monitor over CRT monitor?**

Answer

Following are the advantages of using LCD monitor over CRT monitor:

1) LCD monitor consume less power as compared to CRT monitor.
2) An LCD monitor is significantly thinner and lighter than a CRT monitor, typically weighing less than half as much. In addition, you can mount an LCD on an arm or a wall, which also takes up less desktop space.
3) LCD displays are much more adjustable than CRT displays. With LCDs, you can adjust the tilt, height, swivel, and orientation from horizontal to vertical mode.
4) LCD displays turn each pixel off individually, they do not produce a flicker like CRT displays do. In addition, LCD displays do a better job of displaying text compared with CRT displays.
5) LCD monitor does not flicker the image, whereas, CRT monitor does.

xii. **Why LED monitors are better choice for LCDs? Give three reasons to support your answer.**

Answer

LED monitors are better choice for LCDs, the reasons are:

1. In contrast to LCDs, LED monitors produce bright images and emit fewer radiations.
2. LEDs run at lower temperatures and consume less power as compare to LCDs.
3. Lifespan of LED monitors is longer than LCD monitors.

xiii. **Why dot-matrix printers are becoming obsolete?**

Answer

Dot-matrix printers are becoming obsolete because dot-matrix printers are noisy, have limited printing quality, low printing speed and also have limited color printing.

xiv. **What are the advantages of using laser printer over dot matrix printer?**

Answer

A laser printer is much faster and still cheaper to operate than an inkjet, but cannot create carbon copies and the toner cartridges are expensive even if they last a long time. Whereas, a dot matrix printer is slower, noisier and lower print quality but much cheaper to operate (ribbons are very cheap, and last a long time) and very reliable. It can also create carbon copies due to the fact that it prints using impacts.

xv. **Give any three uses of plotters.**

Answer

Uses of plotters

Plotters are used for a variety of applications, which include:

➢ Drawing graphs
➢ Making maps
➢ Plotting civil engineering drawings/machine components

Q.3 Write long answers of the following questions.

i. **Describe the types of system software.**

Answer

Types of System Software

Some types of system software are:

> Operating system
> Device Drivers
> Utility Software
> Language Processors/Translators

1. Operating System

Operating system manages the hardware and software resources of a computer system, such as CPU, storage devices and all the input/output devices. Some commonly used operating systems are Windows, Linux, Mac OS and Android.

Tasks of Operating System

Operating system performs the following tasks:

> Allocates system resources
> Manages files by maintaining a proper file and folder system
> Loads and executes application software
> Controls the operation of all the input/output devices
> Maintains security
> Controls network operations
> Provides user interface

2. Device Drivers

Device drivers are system software that control the operation of hardware devices. When we attach any type of device, such as printer, scanner, network card, or digital camera to a computer, it will not work without a device driver. We have to first install the driver of a device in our computer before using it. Device manufacturers provide device drivers. Some devices like Mouse, Keyboard, Monitor, USB Flash drive, etc are *"Plug n Play"* devices. Their software is preinstalled with Windows. When attached, the computer system automatically recognizes them.

3. Utility Software

Utility software (or simply utilities) provides additional facilities to carry out tasks, which are beyond the capabilities of the operating system. A few important utilities are disk defragmenter, disk cleaner, file compression utilities, antivirus utility, file manager, network utilities and utilities to configure hardware devices.

4. Language Processors/Translators

The computer can only understand machine language, which consists of 0's and 1's. Therefore, any program written in assembly language or high-level language must be translated to machine language before execution by the computer. Language processors are used to translate computer programs into machine language.

Types of Language Processors

The types of language processors are as follows:

> Assembler
> Compiler
> Interpreter

a. Assembler

Assembler is software that translates assembly language program into machine language. Assembly language consists of symbolic abbreviations called *mnemonics*, which must be translated into machine language before execution by the computer. Each computer has its own assembly language.

b. Compiler

Compiler is software that translates a program written in a high-level language into machine language. It converts the entire program into machine language before execution by the computer.

c. Interpreter

Interpreter is software that translates high-level language into machine language but it translates

one instruction at a time and executes it immediately before the translation of the next instruction.

ii. Why scanners are used? Describe their types.

Answer

Uses of Scanners

Nowadays, scanners are widely used to get drawings, diagrams and photographs into computer systems for incorporation into documents and books, which are made up electronically prior to printing.

Types of Scanners

There are different types of scanners like:

➤ Hand-Held Scanner

➤ Flatbed Scanner

➤ Barcode Reader

1. Hand-held Scanner

To scan an image, the hand-held scanner is dragged over the image to be scanned. The hand-held scanner should be moved, carefully with uniform speed because uneven scanning rate would produce distorted image.

Fig. 1.18 Hand-held Scanner

Uses of Hand-held Scanners

Hand-held scanners are very useful for scanning articles from magazine, newspapers and books

A hand-held scanner is shown is Fig. 1.18.

2. Flatbed Scanner

In a flatbed scanner, the image to be scanned is placed face down on the glass and a cover is lowered over it to exclude light. The camera moves across glass pane reading the entire area. A flatbed scanner is shown in Fig 1.19.

Fig. 1.19 Flatbed Scanner

3. Barcode Reader

Barcode reader is also a type of scanner, which is used to scan barcode, also called *UPC* (Universal Product Code), available on various products. These barcodes contain information about the product like name of the product, company, manufacturing date, expiry date, etc.. This information is provided to the computer for further processing like generating bills at checkouts in shopping malls. Prices are normally not included in barcodes because prices are not constant and may change frequently. A Barcode with reader is shown in Fig 1.20.

Fig. 1.20 Barcode with Reader

iii. What are output devices? Explain its types.

Answer

Output Devices

The devices, which are used to receive and show information from the computer are called output devices. Output devices consist of computer components such as monitor, printer, speaker and plotter that transfer information from computer memory to the outside world. They display or print text, graphics or pictures.

Types of Output Devices

Following are the types of output device:

➤ Monitor

➤ Printer

➤ Plotter

➤ Speaker

1. Monitors

A monitor, sometimes called a VDU (Visual display unit), is an electronic output device for computers. It displays the results of the user activities. The output produced by monitors is called

softcopy output

Types of Monitors

The common types of monitors are as follows:

- CRT (Cathode Ray Tube)
- LCD (Liquid Crystal Display)
- LED (Light Emitting Diodes)

2. Printers

Printers are used to produce hardcopy of output. In the past, printers were connected to the computer through parallel port but now they are connected through USB port.

Characteristics of Printers

Printers vary in their capabilities based on the following characteristics:

- The quality of output
- The ability to print graphics
- The printing speed

Main Categories of Printers

There are two main categories of printers:

- Impact printers
- Non-impact printers

Impact Printer

Impact printers are those printers, which work like typewriters. Impact printers use electromechanical mechanism, which causes the character shape to strike against the paper and leave an image of character on the paper

Non-impact Printers

Non-impact printers produce a printed image without striking the paper. The printing quality and speed of these printers is better than impact printers are. These printers produce very little noise while printing

3. Plotters

Plotters are output device used to produce large size hardcopy output. Plotters are used for a variety of applications, which include drawing graphs, making maps, plotting civil engineering drawings/machine components and producing large size panaflexes.

Types of plotters

Plotters are of two types, which are as follows:

- Flatbed Plotter
- Drum Plotter

4. Speakers

Speakers are audio output devices that are attached to the sound card on motherboard Speakers produce softcopy output in the form of voice. Speakers are available in different shapes and sizes as shown in Fig. 1 30

Fig. 1 30 Speakers

iv. Why plotters are used? Briefly explain their types.

Answer

Plotters

Plotters are used for a variety of applications, which include drawing graphs, making maps, plotting civil engineering drawings/machine components and producing large size panaflexes.

Types of plotters

Plotters are of two types, which are as follows:

> Flatbed Plotter
> Drum Plotter

1 Flatbed Plotter

Flatbed plotter plots on paper that is spread and fixed over a rectangular flatbed as shown in Fig.1.28.

Fig.1.28 Flatbed plotter

Pens of different colours are mounted in the pen holding mechanism that moves on the surface to draw the image

2. Drum Plotter

In drum plotter, paper/sheet is fed from one side and drum of the plotter rotates to move tie paper to the other side. These plotters are used to print large size of panaflexes as shown in Fig. 1.29.

Fig 1.29 Drum Plotter

v. What is non-impact printer? Describe its types.

Answer

Non-impact Printers

Non-impact printers produce a printed image without striking the paper. The printing quality and speed of these printers is better than impact printers are. These printers produce very little noise while printing.

Types of Non-Impact Printers

Commonly used non-impact printers are inkjet and laser printers.

1. Inkjet Printers

Inkjet printers are character printers. They form characters and all kinds of images by spraying small drops of ink on the paper. Inkjet printers are cheap, quiet in operations and can print in multicolour but the printing quality and speed is slower than laser printers. An inkjet printer is shown in Fig. 1.26

Fig. 1.26 Inkjet Printer

2. Laser printers

Laser printers are page printers, meaning that they print an entire page at a time. Their printing technology is very similar to photocopiers. They are very fast and silent in operation. The print quality of laser printer is very high and they can print graphics in multicolour. A laser printer is shown in Fig.1.27.

Fig.1.27 Laser jet Printer

LAB ACTIVITIES

Following lab activities are to be carried out during the practical periods.

1) The assembling and disassembling of the computer system should be demonstrated to the student. (Practically or through some video/animation)

Answer

Practical Work

2) Students should be shown microprocessor, motherboard and power supply unit and the function of these should be explained through video/animation.

Answer

Practical Work

3) All the input/output devices covered in this unit should be shown to the students and their operations should be demonstrated.

Answer

Practical Work

4) The concept of "Plug n Play" devices should be demonstrated/explained practically by attaching such devices.

Answer

Practical Work

5) Hardcopies of various printers and plotters should be shown to the students for comparing print quality.

Answer

Practical Work

6) Students may be taken to the places/organizations where Super, Mainframe and Mini computers are used.

Answer

Practical Work