OVERVIEW OF COMPUTER SYSTEM CHAPTER 1

UNIT INTRODUCTION

Computer systems are now common place in every part of our life. This unit introduces the basic components that make up these computer systems. There are two parts to all computer systems, the hardware and the software. Hardware is the collective name given to all the devices that make up a computer system. Software is the term used for the actual programs that allow the hardware to do a useful job. Software is made up of a series of instructions that tell the computer what to do.

1.1 INTRODUCTION TO COMPUTERS

Q.1 Define computer. Describe its composition also.
Answer
Computer
A computer is an electronic device that accepts data (as Input), performs operations (as Processing) on data at very high speed and produces the results (as Output). It is a programmable machine that executes a programmed list of instructions that it is provided.
Composition of computers
Computers are composed of the Central Processing Unit (CPU), input devices, output devices, primary storage, secondary storage, and communication devices.
Main Component of Computer
The CPU is the main component of a computer that interprets and executes instructions.

Q.2 What is digital computer? Write down the parts of digital computer.
Answer
Digital Computer
A digital computer is a machine that can solve problems for people by carrying out instructions given to it.
Parts of digital computer
A digital computer consists of an interconnected system of processors, memories and input/output devices. A simple computer system is shown in Fig.1.1:

Fig. 1.1 A simple computer system

TECHNOLOGY FACT:
Although we normally think of computers as the ones we use in our everyday lives to surf the web, write documents etc., small computers are also embedded into other things such as mobile phones, toys, microwaves and MP3 players. We use computers all the time, often without even knowing it!

1.1.1 COMPUTING DEVICES

Q.3 Write a note on computing devices.
Answer
Computing Devices
All machines, components or devices that contain embedded, specialized computers are called computing devices.
Examples
Following are some computing devices:
- ATM machine
- Digital alarm clock
- Digital washing machine
- Microwave oven
- Toys
- Cell phones
- CD player

Special Computing Tasks
All the computing devices contain embedded computer chips, which allow the devices to do special computing tasks.
Examples
- The computer of ATM machine gives banking transaction facilities.
- The computer of digital alarm clock sets the time for alarm and manages calendar.
- The computer of digital washing machine can be programmed to wash clothes.

Important computing devices
Some important computing devices are shown in Fig 1.2.

Fig. 1.2 Computing Devices

1.1.2 BASIC OPERATIONS OF A COMPUTER

Q.4 Describe the basic operations of a computer.
Answer
Basic Operations of a Computer
Any computer system, regardless of its size, is capable of performing the following basic operations, which are shown in Fig. 1.3.

Fig.1.3 Basic operations of a computer

1. Input operation
   Accepting data for processing from an input device.
2. Processing operations
   Performing arithmetic and logical operations. Arithmetic operations include addition, subtraction, multiplication and division while logical operations include comparison of different values and decision making.
3. Output operation
   Sending results to an output device.
4. Storage operation
   Writing data to a storage device such as hard disk or USB flash drive.

Q.5 State the purpose of computer system.
Answer
Purpose of Computer System
The purpose of a computer system is to accept data, process it and as a result of processing, produce output in the form of useful information. The input unit of computer presents data to the processor for processing. The results of processing of the data are displayed on the monitor screen, printed on paper or sent to any other output or storage device.

1.1.3 CLASSIFICATION OF DIGITAL COMPUTERS

Q.6 Explain the classification of digital computers.
Answer
Classification of Digital Computers
There are several factors that make computers different from each other. These factors are physical size, cost, speed, etc. Based on these factors, computers are classified into four categories.
- Supercomputer
- Mainframe computer
- Minicomputer
- Microcomputer

1. Supercomputer
   Supercomputers are the largest, the most expensive and powerful computers.

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

iii. They are used to process complex calculations as well as designing and controlling of complicated machines, such as rockets and fighter planes.

Best-known Supercomputers
The best-known supercomputers are built by Cray Inc. an American supercomputers manufacturers and IBM.
A supercomputer is shown in Fig. 1.4.

Fig.1.4 Modern Supercomputer

2. Mainframe computer
   Mainframe computers are larger, more expensive and powerful computers compared to minicomputer but less powerful than supercomputers.

Space for Mainframes
Mainframes usually fill a large room because they include many types of peripheral devices.
Instructions Execution of Mainframes
A typical mainframe can execute about trillion instructions per second (TIPS) and can support thousands of users.
Uses of Mainframe computers
Mainframe computers are used in large corporations, banks, universities and scientific laboratories.
Examples of Mainframes
Some examples of mainframe are IBM's Enterprize EC12, EC 196 and HP 16500 Series.
A mainframe is shown in Fig.1.5.

Fig. 1.5 Mainframe computer

3. Minicomputer
   Minicomputers are larger and more expensive than microcomputers. Minicomputer and its peripheral equipment can usually fill a small room. Minicomputers can support hundreds of users at a time. Minicomputers are faster than microcomputers.
Instructions Execution of Minicomputers
Minicomputers can execute billions of instructions per second (BIPS). These computers can process more data than microcomputers.
Uses of minicomputers
Minicomputers are widely used in industrial process control, scientific research and small business applications.
Microcomputer 'vs' Minicomputer
Due to advancement of technology, the difference between the performance of microcomputer and minicomputer is gradually decreasing. As a result, modern microcomputers are replacing the more expensive minicomputers.

Fig. 1.6 Minicomputer

Examples of Minicomputers
Examples of minicomputer are IBM System/36 and HP 3000.
A minicomputer is shown in Fig.1.6.

4. Microcomputers
   Microcomputer, is the smallest and least expensive computer.

Technology used in Microcomputers
Its small size is a result of LSI (Large Scale Integration) and VLSI (Very large Scale Integration) technologies. A modern microcomputer can execute millions of instructions per second (MIPS).
Comparison
Although, microcomputers are very fast but they are much slower than minicomputers and mainframes.
Parts of Microcomputer
A typical microcomputer (as shown in Fig.1.7) consists of a Keyboard, a Mouse, a Monitor and System Unit.
Uses of Microcomputers
Microcomputers are used at home for personal use as well as for business applications. A large variety of software is available for use on microcomputers.

Fig. 1.7 Microcomputer

Space for A Microcomputer
A microcomputer can easily fit on a desktop or in a briefcase in the form of laptop computer.
Examples of Microcomputers
Some examples of microcomputer are IBM Thinkpad, Toshiba Satellite series, Dell XPS, HP Envy series and Apple series.

DO YOU KNOW?
The first electro-mechanical computer was developed in 1939. (Get more info from the Internet)

Answer
More information from the Internet
The Z2 was a mechanical and relay computer created by Konrad Zuse in 1939. It was an improvement on the Z1, using the same mechanical memory but replacing the arithmetic and control logic with electrical relay circuits.
Specifications

Frequency	Ca. 5 Hertz
Arithmetic Unit	Fixed point arithmetic unit with 16 bit word length.
Average Calculation Speed	0.8 sec for addition operation
Number of Relays	600
Memory	64 words
Power Consumption	1000 watts
Weight	300 kg (660 lb)

1.1.4 MODERN USE OF COMPUTERS IN TODAY'S LIFE

Q.7 Write a note on mobile computing.
Answer
Mobile Computing
Mobile Computing refers to a variety of small portable devices such as shown in Fig.1.8 that allow people to access data and information from anywhere in a wireless network system.
Mobile computing devices run on batteries and have limited functionality as compared to laptops.
Popular mobile computing devices
Following are popular mobile computing devices:
- Tablet PCs
- PDAs (Personal Digital Assistants)
- Smart phones

Fig. 1.8 Tablet PC and PDA

Q.8 Write a note on internet of things.
Answer
Internet of Things (IoT)
Internet of Things (IoT) is the interconnection between computer network and physical devices to collect and exchange data.
Devices used in daily life can be equipped with wireless connectivity, and embedded with software, sensors, actuators, cameras, microphones and other instruments that enable them to collect and share data.
Smart devices
All kinds of household items can be modified to work in an Internet of Things (IoT) system. These device are known as smart devices and they are designed in such a way that they can interact with human beings through wireless connection.
Smart Home
Smart home is a popular application of IoT.
Future of IoT
In future, IoT will allow us to switch on air conditioning before reaching home or switch off lights after leaving home.
Remotely Controlled Devices
There are homes equipped with various types of electronic devices that can be controlled remotely with smart phone or computer through IoT system.

Q.9 What is meant by cloud computing? Describe its advantage and disadvantages.
Answer
Cloud Computing
Cloud computing means instead of buying and installing your own computer system and software at your workplace, you can get it as a service provided and managed by another company. You can perform computing tasks through access to service over the Internet. It does not matter where the hardware and software is located. It is just somewhere in the "cloud". It is a way of outsourcing your computing requirements.
Advantage of Cloud Computing
The advantage of cloud computing is that you do not have to buy and maintain a complex computer system. This cuts cost of buying computers and peripherals. Besides, you are not worried about equipment going out of date and other problems related with-system security and reliability.
Disadvantage of Cloud Computing
The disadvantage of cloud computing is that it requires a reliable high speed broadband connection

functioning the whole time you are working.
Another disadvantage of cloud computing is the privacy and security risk of having valuable data on someone else's system in an unknown location.

Q.10 What is meant by data center? Describe its parts, environment and uses.
Answer
Data Centers
Data center is a centralized location for collecting, storing, processing and distribution of vast amount of data.
Parts of Data Centers
It consists of servers, routers, switches and backup equipment.
Environment for Data Centers
A data center facility usually requires air conditioning, fire suppression, smoke detection and security entry. It may be used in a room, an entire building or a group of buildings.
Use of Data Centers
Organizations such as government agencies, banks, educational institutions, telecommunication companies and social networking services use large amount of data and thus have requirement for data center. Many companies are moving their data centers to cloud services to cut the cost of running their own computing networks and servers.

1.1.5 COMPUTER HARDWARE AND SOFTWARE

Q.11 Name the parts of a computer system.
Answer
Parts of a computer system
A computer system consists of hardware and software.

Q.12 Define hardware and give examples.
Answer
Hardware
Computer hardware is what you can physically touch and see. In simple words, all tangible parts of computer system are referred as hardware.
Examples of computer hardware
All physical components of computer system, such as monitor, keyboard, hard disk, printer, alongwith the circuitry connecting them are known as computer hardware.

Q.13 Define software and state its need. Also give few examples.
Answer
Software
Software is any set of instructions, also called programs, which are given to the computer to perform any task or to do any activity. It tells the computer what to do and how to do. Programming languages are used to prepare software.
Need of software
A computer cannot do anything on its own. It must be instructed to do a desired job. Hence, it is necessary to specify a sequence of instructions, which a computer must perform to solve a problem.
Examples of software
Word-processing software, spreadsheet software and database management software may contain many programs for creating, editing, formatting and printing different types of documents.

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Examples of software
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1.2 TYPES OF COMPUTER SOFTWARE

Q.14 Name the types of computer software.
Answer
Types of Computer Software
Computer software can be classified into the following types:
- System Software
- Application Software
- Internet Applications

Licensed Software, Open Source Software, Shareware and Freeware

1.2.1 SYSTEM SOFTWARE

Q.15 Define system software. Write its purpose and give examples of system software.
Answer
System 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.
Purpose of System Software
The purpose of system software is to make the use of computer more effective and efficient. A computer without some kind of system software would be ineffective and impossible to operate.
Examples of System Software
Some examples of system software are:
- Operating system
- Device Drivers
- Utility Software
- Language Processors/Translators

Q.16 Define operating system and give its examples. Also state the tasks which are performed by operating system.
Answer
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.
Examples of Operating system
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.

Q.17 Write a note on device drivers.
Answer
Device Drivers
Device drivers are system software that control the operation of hardware devices.
Installation of Device Drivers
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.
Plug n Play Devices
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.

Q.18 Define utility software and name few important utility software.
Answer
Utility Software
Utility software (or simply utilities) provides additional facilities to carry out tasks, which are beyond the capabilities of the operating system.
Important Utility Software
A few important utilities are disk defragmenter, disk cleaner, file compression utilities, antivirus utility, file manager, network utilities and utilities to configure hardware devices.

Q.19 What is meant by language processor? Describe its types also.
Answer
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

1. 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.

2. 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.
3. 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.

1.2.2 APPLICATION SOFTWARE

Q.20 Define and explain application software.
Answer
Application software
Application software is a set of programs designed to perform a specific task.

Example
Application software for payroll processing produces pay slips and application software for processing examination results produces mark sheets along with some other statistical reports.
Types of Application Software
Some types of application software are:
- Productivity Software
- Business Software
- Entertainment Software
- Educational Software

1. Productivity Software
   Productivity software is used to improve the way people do their work. It speeds up the daily routine tasks performed by individuals and teams by eliminating the repetitive tasks.

Examples
Productivity software includes word-processing, spreadsheet, database management and graphics software.

2. Business Software
   Business software is used to run business activities. It helps in efficiently running business functions of a company.

Examples
Examples of business software are payroll, accounting, inventory and retail software.

3. Entertainment Software
   Entertainment software is used to entertain people. It includes games, audio video player, etc.

Examples
Examples of entertainment software are VLC player, EA cricket, Windows Media Player, etc.

4. Educational Software
   Educational software is used for learning purpose.

Examples
Examples of educational software are programs that teach about human body, working of an engine, solar system, typing, foreign language, music and subjects like Mathematics, Physics, Chemistry, etc.

1.2.3 INTERNET APPLICATIONS

Q.21 What are important internet applications? Explain.
Answer
Internet Applications
Following are the important internet applications:
- Web Applications
- Cloud Computing Applications
- Social Media Network Applications

1. Web Applications
   A web application is a program that runs on a remote server while its users interact with it through a web browser.

Common Web Applications
Some common web applications include web-based email programs (such as Gmail, Hotmail), online ticketing service, online banking service, online auction, online retail sales, instant messaging services, etc.

2. Cloud Computing Applications
   Cloud application is a program that supports cloud computing. A cloud application is entirely stored

on a remote server and is delivered over the Internet through a web browser. Users of a cloud application need a computer with a high-speed Internet connection.

3. Social Media Network Applications
   Social media is an Internet-based communication system that allows the creation and exchange of information, ideas, common interests and other forms of expression. Social media websites connect users with their friends, family and colleagues using internet.

Q.22 Explain the popular examples of social media.
Answer
Popular Examples of Social Media
Some popular examples of social media are Facebook, Twitter and WhatsApp.

1. Facebook
   Facebook is one of the fastest growing free social networking services used by millions of people all over the world. It allows registered users to create profile and exchange messages, photos, videos and links with other users. It helps users stay updated with what is happening around the world. It provides a platform by which users can create groups and pages based on their common interests and share views and ideas.
2. Twitter
   Twitter is an online news and social networking service which allows subscribers to broadcast short messages to other subscribers of the service. The short messages known as "tweets" are restricted to 140 characters. It is free to join service. It is very different from email and more like a news broadcast. Users of Twitter service type short statements about what is going on in their life, what they are doing and what their thoughts and opinions are on specific topics or current affairs. People all over the world are continually broadcasting tweets, which can be viewed by anyone.
3. WhatsApp
   WhatsApp is a free instant messaging service for smart phone users to exchange text, photos, videos and audio messages through Internet. It has become the largest messaging service around the world. WhatsApp is very popular among teenagers because of features like group chatting, voice messages and location sharing. It was started for Android mobile devices but now it is available for iPhone, BlackBerry, Windows Phone and Nokia smart phone also.

1.2.4 LICENSED SOFTWARE, OPEN SOURCE SOFTWARE, SHAREWARE AND FREEWARE

Q.23 Write a note on 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.
Copyright Law
The software license deals with the Copyright Law. Copyright law prevents illegal copying of computer software. It allows creators of computer software to benefit financially from their software and to retain some control over how it is used.
Violation of Copyright
When the software is given away free, it makes it difficult for the software creators to stay in business. This makes it improper to make copies of software and sell it. Software that is copied and sold without the permission of the owner is known as pirated software and it is violation of copyright.
Examples of Licensed Software
Examples of licensed software are Microsoft Windows and Microsoft Office.

Q.24 Define open source software. Also give examples.
Answer
Open Source Software
Open Source Software is computer software that is available in the form of source code that allows users to study, change and improve it. It is free for inspection, modification and distribution. It allows certain rights, which are normally protected by Copyright Law.
Example
Linux operating system is open source software.

Q.25 Write a note on:
i) Shareware ii) Freeware
Answer
Shareware
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.
Examples
Some antivirus software are shareware.
Freeware
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.
Examples
Some examples of freeware are:
- Skype
- Viber
- Mozilla Web browser

1.2.5 FIRMWARE

Q.26 Define firmware.
Answer
Firmware
Firmware is an intermediate form between hardware and software. It consists of software embedded in electronic devices during their manufacturing. Firmware is used when the programs are rarely or never expected to be changed, for example, in toys, appliances and ROM. Firmware is also used when the programs must not be lost when the power is off.

1.2.6 INTERNET APPLICATION SECURITY

Q.27 Briefly explain internet application security and its parts.
Answer
Internet Application Security
Internet application security refers to preventive measures against threads that can harm the Internet applications. Internet applications are available 24/7 and offer access to many people leading to high risk of intrusion. Internet applications are venerable to a wide variety of threats. Hackers can steal, modify or delete sensitive data. To ensure application security, it is essential to continuously monitor the activity of server on which the application is running and block hackers trying to obtain sensitive data.

Parts of Internet application security system
Internet application security system consists of following programs:
- Firewalls
- Anti-Virus Programs
- Spyware Detection
- Removal Programs
- Encryption/Decryption Programs

1.3 COMPUTER HARDWARE

Q.28 Define hardware and name parts of computer system.
Answer
Hardware
The physical components of a computer that we can see, touch and feel are called hardware.
Parts of computer hardware
Computer hardware consists of input/output devices, storage devices, central processing unit (CPU) and the electronic circuitry that links these devices for communicating with each other.

1.3.1 INPUT DEVICES

Q.29 Describe the use of input devices. Also make a list of input devices.
Answer
Use of Input Devices
The input devices are used to communicate with the computer. They consist of devices that accept data and convert it into machine-readable form. These devices are often referred to as peripherals because they are physically separated from the system unit.
List of Input Devices
Some input devices are as follows:
- Keyboard
- Mouse
- Joystick
- Microphone
- Image Scanners

Q.30 Write a note on keyboard.
Answer
Keyboard
Keyboard is the primary input device for the input of data to a computer, though voice input devices may ultimately supersede it. It operates by converting key presses to electronic signals in digital form. Keyboard has the standard character keys together with numeric keys and special keys.

Q.31 What is meant by pointing device? Explain some commonly used pointing devices.
Answer
Pointing Devices
Pointing devices are used to control the movement of the pointer (cursor) to select items on a screen or open computer programs or files.
List of Pointing Devices
Commonly used pointing devices are as follows:
- Mouse
- Trackball
- Joystick

- Touch Screen
- Light Pen
- Touch Pad

1. Mouse
   Mouse is a pointing device. As we move the mouse over the surface of desk, the movements of the ball are detected by the internal mechanism. At the front of the mouse's casing are two or three buttons. These buttons are used to perform tasks, such as picking options displayed on the screen. A mouse is shown in Fig. 1.9.

Fig. 1.9 Mouse

Mouse is an essential part of the hardware on almost all the microcomputers running Windows and other application software.

2. Optical mouse
   Optical mouse is becoming very popular and it is replacing the mechanical mouse. An optical mouse uses a light-emitting diode and photodiodes to detect movement relative to the underlying surface, rather than internal moving parts (mouse ball and rollers) as in mechanical mouse.

DO YOU KNOW?
The First Computer Mouse was invented by Doug Engelbart in around 1964 and was made of wood.

3. Trackball
   Trackball remains stationary on the surface. The ball, at the top, is rolled with fingers. It has buttons that are used to perform operations similar to those performed by a mouse. A trackball is shown in Fig. 1.10.

Fig. 1.10 Trackball

4. Joystick
   Joystick is commonly used for playing computer games. It is fixed on the table and it has a stick in the centre that can be tilted in any direction. The stick is held by hand and when it is tilted in any direction, the movement is translated into the movement of an object on the screen. The buttons are used to perform actions such as firing guns and lasers. A joystick is shown in Fig. 1.11.

Fig. 1.11 Joystick

5. Touch Screen
   A touch screen is a computer display screen. It is an input as well as output device. The screen is sensitive to pressure. User interacts with the computer by touching pictures or words on the screen as shown in Fig.1.12.

Fig. 1.12 Touch Screen Monitor

Instead of using a pointing device user can use finger to point directly to objects on the screen. Touch screens are generally attached to computers but they are also popular in other devices such as mobile phones, satellite navigators and Personal Digital Assistants (PDAs).

6. Light Pen
   Light Pen looks like a pen with a photocell at its tip as shown in Fig. 1.13.

Light Pen is used to point to an object or draw on the screen. It gives more accuracy than pointing with our finger on the touch screen. It is mainly used in engineering for designing purpose.

Fig. 1.13 Light Pen

7. Touch Pad
   Touch pad is used in laptop computers as shown in Fig.1.14. Touch pad is a pointing device that can sense the movement and position of finger on the pad. They are commonly used as an alternate to computer mouse in a laptop computer. There are two buttons located above or below the pad and their function is the same as the buttons on the mouse.

Fig. 1.14 Touch Pad

Q.32 Describe the purpose of microphone.
Answer
Microphone
Microphone is used to convert the spoken words to digital signals for computer input. It converts audio signals to electrical waves and these are converted by electronic circuitry in the computer to digital form. A microphone is shown in Fig. 1.15.

Fig. 1.15 Microphone

Q.33 Write a note on digital camera.
Answer
Digital Camera
Digital Camera is a camera that captures pictures and stores them in digital form. Pictures taken by a digital camera can be downloaded to a computer for viewing and editing.
Digital cameras have a LCD for viewing both images in the viewfinder and those in the camera's memory. It is an input as well as output device. A digital camera is shown in Fig.1.16.

Fig. 1.16 Digital Camera

Q.34 Define scanner. Describe its uses and types.
Answer
Scanners
Scanner is an optical input device that optically scans printed or handwritten text and images and stores them in computer memory in digital form.
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.
   Uses of Hand-held Scanners
   Hand-held scanners are very useful for scanning articles from magazine, newspapers and books.

Fig. 1.18 Hand-held Scanner

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 and updating 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

Q.35 What are magnetic stripe cards? Give some examples.
Answer
Magnetic Stripe Cards
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
Examples of these cards include credit cards, ATM cards, VISA and MasterCard, driver's license and membership cards. A magnetic stripe card is shown is Fig.1.21.

Fig. 1.21 Magnetic Stripe Card

1.3.2 OUTPUT DEVICES

Q.36 Write a note on output devices.
Answer
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.

Q.37 What is meant by hardcopy and softcopy?
Answer
Hardcopy
The output generated on paper by an output device such as printer or plotter is called Hardcopy output.
Softcopy
The output in the form of data or information stored on a storage device or displayed on a monitor is called Softcopy output.

Q.38 What are monitors? Describe their features.
Answer
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.
Features of Monitors
There are different types and sizes of monitors, each can be distinguished on the basis of the following features

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

Objective

Q.1 Select the correct choice from the following questions.

1. **There are two parts to all computer systems:**
   A. System unit and CPU B. Hardware and Software
   C. Software and Communication devices D. input/output devices
2. **It is the main component of a computer that interprets and executes instructions:**
   A. CPU B. System Unit C. Hardware D. Software
3. **The operation in which data is accepted from devices is called:**
   A. Storage operation B. Output operation
   C. Processing operation D. Input operation
4. **The operation in which arithmetic and logical operations are performed is called:**
   A. Storage operation B. Output operation
   C. Processing operation D. Input operation
5. **The operation in which result is sent to device is called:**
   A. Storage operation B. Output operation
   C. Processing operation D. Input operation
6. **The operation in which data is written on a device is called:**
   A. Storage operation B. Output operation
   C. Processing operation D. Input operation
7. **They are used to process complex calculations as well as designing and controlling of complicated machines, such as rockets and fighter planes:**
   A. Supercomputers B. Mainframe computers
   C. Minicomputers D. Microcomputers
8. **These computers are used in large corporations, banks, universities and scientific laboratories:**
   A. Supercomputers B. Mainframe computers
   C. Minicomputers D. Microcomputers
9. **IBM's Enterprize EC12, EC 196 and HP 16500 Series are examples of:**
   A. Supercomputers B. Mainframe computers
   C. Minicomputers D. Microcomputers
10. **These are widely used in industrial process control, scientific research and small business applications:**
    A. Supercomputers B. Mainframe computers
    C. Minicomputers D. Microcomputers
11. **IBM System/36 and HP 3000 are examples of:**
    A. Supercomputers B. Mainframe computers
    C. Minicomputers D. Microcomputers
12. **Its small size is a result of LSI (Large Scale Integration) and VLSI (Very large Scale Integration) technologies:**
    A. Supercomputers B. Mainframe computers
    C. Minicomputers D. Microcomputers
13. **These are used at home for personal use as well as for business applications:**
    A. Supercomputers B. Mainframe computers
    C. Minicomputers D. Microcomputers
14. **IBM Thinkpad, Toshiba Satellite series, Dell XPS, HP Envy series and Apple series are examples of:**
    A. Supercomputers B. Mainframe computers
    C. Minicomputers D. Microcomputers
15. **The first electro-mechanical computer was developed in:**
    A. 1919 B. 1929 C. 1949 D. 1939
16. **It is the interconnection between computer network and physical devices to collect and exchange data:**
    A. Cloud computing B. Computing devices
    C. Data center D. IoT

17. **It means instead of buying and installing your own computer system and software at your workplace:**
    A. Cloud computing B. Computing devices
    C. Data center D. IoT
18. **It is a way of outsourcing your computing requirements:**
    A. Cloud computing B. Computing devices
    C. Data center D. IoT
19. **It is a centralized location for collecting, storing, processing and distribution of vast amount of data:**
    A. Cloud computing B. Computing devices
    C. Data center D. IoT
20. **It consists of servers, routers, switches and backup equipment:**
    A. Cloud computing B. Computing devices
    C. Data center D. IoT
21. **It is what you can physically touch and see:**
    A. Freeware B. Hardware C. Firmware D. Software
22. **All tangible parts of computer system are referred as:**
    A. Freeware B. Hardware C. Firmware D. Software
23. **Monitor is a kind of:**
    A. Freeware B. Hardware C. Firmware D. Software
24. **Keyboard is a kind of:**
    A. Freeware B. Hardware C. Firmware D. Software
25. **Printer is a kind of:**
    A. Freeware B. Hardware C. Firmware D. Software
26. **It is any set of instructions, which are given to the computer to perform any task or to do any activity:**
    A. Freeware B. Hardware C. Firmware D. Software
27. **It tells the computer what to do and how to do:**
    A. Freeware B. Hardware C. Firmware D. Software
28. **It is a collection of system programs that control and coordinate the activities of a computer system:**
    A. System software B. Application software C. Shareware D. Freeware
29. **It consists of a collection of operative programs required to control computer hardware and also to execute application software:**
    A. System software B. Licensed software C. Shareware D. Freeware
30. **Operating system is a kind or example of:**
    A. System software B. Application software C. Shareware D. Freeware
31. **Device driver is a kind or example of:**
    A. System software B. Application software C. Shareware D. Freeware
32. **Utility software is a kind or example of:**
    A. System software B. Application software C. Shareware D. Freeware
33. **Language Processor is a kind or example of:**
    A. System software B. Application software C. Shareware D. Freeware
34. **It manages the hardware and software resources of a computer system:**
    A. Device driver B. Operating system C. Utility software D. Language translator
35. **These are system software that control the operation of hardware devices:**
    A. Device driver B. Operating system C. Utility software D. Language translator
36. **These are used to translate computer programs into machine language.**
    A. Device driver B. Operating system
    C. Utility software D. Language processor
37. **It is software that translates assembly language program into machine language:**
    A. Assembler B. Compiler C. Interpreter D. Convertor

38. **It is a set of programs designed to perform a specific task:**
    A. System software B. Application software C. Shareware D. Freeware
39. **This software is used to improve the way people do their work:**
    A. Productivity software B. Business software
    C. Entertainment software D. Educational software
40. **This software helps in efficiently running business functions of a company:**
    A. Productivity software B. Business software
    C. Entertainment software D. Educational software
41. **This software is used to entertain people. It includes games, audio video player, etc..**
    A. Productivity software B. Business software
    C. Entertainment software D. Educational software
42. **This software is used for learning purpose.**
    A. Productivity software B. Business software
    C. Entertainment software D. Educational software
43. **The computer software that is available in the form of source code that allows users to study, change and improve it:**
    A. Open source software B. Licensed Software
    C. Productivity software D. Business software
44. **This is given to people free of charge for a limited time period:**
    A. System software B. Application software C. Shareware D. Freeware
45. **It is available for use, free of cost. It is usually full version of the software for an unlimited period:**
    A. System software B. Application software C. Shareware D. Freeware
46. **It is an intermediate form between hardware and software:**
    A. Freeware B. Shareware C. Firmware D. Firewalls
47. **It refers to preventive measures against threads that can harm the Internet applications:**
    A. Cloud computing B. Computing devices
    C. Internet application security D. IoT
48. **These devices consist of devices that accept data and convert it into machine-readable form:**
    A. Input devices B. Output devices
    C. Communication devices D. Storage devices
49. **These devices are often referred to as peripherals because they are physically separated from the system unit:**
    A. Input devices B. Output devices
    C. Communication devices D. Storage devices
50. **Keyboard is a kind of:**
    A. Input devices B. Output devices
    C. Communication devices D. Storage devices
51. **Mouse is a kind of:**
    A. Input devices B. Output devices
    C. Communication devices D. Storage devices
52. **Microphone is a kind of:**
    A. Input devices B. Output devices
    C. Communication devices D. Storage devices
53. **Scanner is a kind of:**
    A. Input devices B. Output devices
    C. Communication devices D. Storage devices
54. **Optical mouse is a kind of:**
    A. Pointing devices B. Output devices
    C. Communication devices D. Storage devices
55. **Trackball is a kind of:**
    A. Pointing devices B. Output devices
    C. Communication devices D. Storage devices

56. **Touch screen is a kind of:**
    A. Pointing devices B. Output devices
    C. Communication devices D. Storage devices
57. **Light pen is a kind of:**
    A. Pointing devices B. Output devices
    C. Communication devices D. Storage devices
58. **Touchpad is a kind of:**
    A. Pointing devices B. Output devices
    C. Communication devices D. Storage devices
59. **The First Computer Mouse was invented by:**
    A. Blaise Pascal B. Charles Babbage C. John Napier D. Doug Engelbart
60. **It is an input as well as output device:**
    A. Trackball B. Touch screen C. Joystick D. Scanner
61. **To scan an image, it is dragged over the image to be scanned:**
    A. Hand-Held Scanner B. Flatbed Scanner C. Barcode reader D. Sheet-fed scanner
62. **In this scanner, the image to be scanned is placed face down on the glass and a cover is lowered over it to exclude light:**
    A. Hand-Held Scanner B. Flatbed Scanner C. Barcode reader D. Sheet-fed scanner
63. **The output generated on paper by an output device such as printer or plotter is called:**
    A. Neatcopy B. Roughcopy C. Hardcopy D. Softcopy
64. **These devices transfer information from computer memory to the outside world:**
    A. Storage devices B. Output devices
    C. Processing devices D. Input devices
65. **The output in the form of data or information stored on a storage device or displayed on a monitor is called:**
    A. Neatcopy B. Roughcopy C. Hardcopy D. Softcopy
66. **Standard size of monitor is from:**
    A. 15 to 22 inches B. 17 to 22 inches C. 19 to 22 inches D. 10 to 22 inches
67. **CRT stands for:**
    A. Crystal Ray Tube B. Carbon Ray Tube
    C. Common Reflection Tube D. Cathode Ray Tube
68. **LCD stands for:**
    A. Light Carbon Display B. Low Crystal Display
    C. Least Carbon Display D. Liquid Crystal Display
69. **LED stands for:**
    A. Light Emitting Diode B. Light Emitting Display
    C. Least Emitting Display D. Liquid Emitting Display
70. **These are used to produce hardcopy of output:**
    A. Printer B. Scanner C. Touch screen D. Digital camera
71. **These are output device used to produce large size hardcopy output:**
    A. Printer B. Plotter C. Touch screen D. Digital camera
72. **These printers have 9 or 24 pins arranged in a matrix to print shapes of characters:**
    A. Dot matrix printers B. Laser printers C. Chain printers D. Inkjet printers
73. **These printers move rapidly by two geared pulleys while printing:**
    A. Dot matrix printers B. Laser printers C. Chain printers D. Inkjet printers
74. **These printers print characters and all kinds of images by spraying small drops of ink on the paper:**
    A. Dot matrix printers B. Laser printers C. Chain printers D. Inkjet printers
75. **These printers are page printers, meaning that they print an entire page at a time:**
    A. Dot matrix printers B. Laser printers C. Chain printers D. Inkjet printers

Answers:

1.	Hardware and Software	**2.**	CPU
3.	Input operation	**4.**	Processing operation

5.	Output operation	**6.**	Storage operation
7.	Supercomputers	**8.**	Mainframe computers
9.	Mainframe computers	**10.**	Minicomputers
11.	Minicomputers	**12.**	Microcomputers
13.	Microcomputers	**14.**	Microcomputers
15.	1939	**16.**	IoT
17.	Cloud computing	**18.**	Cloud computing
19.	Data center	**20.**	Data center
21.	Hardware	**22.**	Hardware
23.	Hardware	**24.**	Hardware
25.	Hardware	**26.**	Software
27.	Software	**28.**	System software
29.	System software	**30.**	System software
31.	System software	**32.**	System software
33.	System software	**34.**	Operating system
35.	Device driver	**36.**	Language processor
37.	Assembler	**38.**	Application software
39.	Productivity software	**40.**	Business software
41.	Entertainment software	**42.**	Educational software
43.	Open source software	**44.**	Shareware
45.	Freeware	**46.**	Firmware
47.	Internet application security	**48.**	Input devices
49.	Input devices	**50.**	Input devices
51.	Input devices	**52.**	Input devices
53.	Input devices	**54.**	Pointing devices
55.	Pointing devices	**56.**	Pointing devices
57.	Pointing devices	**58.**	Pointing devices
59.	Doug Engelbart	**60.**	Touch screen
61.	Hand-Held Scanner	**62.**	Flatbed Scanner
63.	Hard Copy	**64.**	Output devices
65.	Softcopy	**66.**	15 to 22 inches
67.	Cathode Ray Tube	**68.**	Liquid Crystal Display
69.	Light Emitting Diode	**70.**	Printer
71.	Plotter	**72.**	Dot matrix printers
73.	Chain printers	**74.**	Inkjet printers
75.	Laser printers		

Q.2 Give short answers of the following questions.

Q1: Define computer.

Ans. A computer is an electronic device that accepts data (as Input), performs operations (as Processing) on data at very high speed and produces the results (as Output). It is a programmable machine that executes a programmed list of instructions that it is provided.

Q2: Define digital computer.

Ans. A digital computer is a machine that can solve problems for people by carrying out instructions given to it.

Q3: Give some examples of computing devices.

Ans. Following are some computing devices:

- ATM machine
- Digital alarm clock
- Digital washing machine
- Microwave oven

5.	Output operation	6.	Storage operation
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9.	Mainframe computers	10.	Minicomputers
11.	Minicomputers	12.	Microcomputers
13.	Microcomputers	14.	Microcomputers
15.	1939	16.	IoT
17.	Cloud computing	18.	Cloud computing
19.	Data center	20.	Data center
21.	Hardware	22.	Hardware
23.	Hardware	24.	Hardware
25.	Hardware	26.	Software
27.	Software	28.	System software
29.	System software	30.	System software
31.	System software	32.	System software
33.	System software	34.	Operating system
35.	Device driver	36.	Language processor
37.	Assembler	38.	Application software
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- Digital alarm clock
- Digital washing machine
- Microwave oven

- Toys
- Cell phones
- CD player

Q4: Give some examples of computing devices.

Ans.

1. The computer of ATM machine gives banking transactions facilities.
2. The computer of digital alarm clock sets the time for alarm and manages calendar.
3. The computer of digital washing machine can be programmed to wash clothes.

Q5: Briefly describe the purpose of a computer system.

Ans. The purpose of a computer system is to accept data, process it and as a result of processing, produce output in the form of useful information. The input unit of computer presents data to the processor for processing. The results of processing of the data are displayed on the monitor screen, printed on paper or sent to any other output or storage device.

Q6: Describe the factors on which we can classify the computers.

Ans. There are several factors that make computers different from each other. These factors are physical size, cost, speed, etc.. Based on these factors, computers are classified into four categories.

1) Supercomputers
2) Mainframe computers
3) Minicomputers
4) Microcomputers

Q7: Give some uses of supercomputers.

Ans.

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.

Q8: Give some uses and examples of mainframe computers.

Ans. Uses: Mainframe computers are used in large corporations, banks, universities and scientific laboratories.

Examples: Some examples of mainframe are IBM's Enterprize EC12, EC 196 and HP 16500 Series.

Q9: Give some uses and examples of minicomputers.

Ans. Uses: Minicomputers are widely used in industrial process control, scientific research and small business applications.

Examples: Examples of minicomputer are IBM System/36 and HP 3000.

Q10: Give some uses and examples of microcomputers.

Ans. Uses: Microcomputers are used at home for personal use as well as for business applications. A large variety of software is available for use on microcomputers.

Examples: Some examples of microcomputer are IBM Thinkpad, Toshiba Satellite series, Dell XPS, HP Envy series and Apple series.

Q11: Name some popular mobile computing devices.

Ans. Following are popular mobile computing devices:

- Tablet PCs
- PDAs (Personal Digital Assistants)
- Smart phones

Q12: Which smart devices are used in IoT?

Ans. All kinds of household items can be modified to work in an Internet of Things system. These device are known as smart devices and they are designed in such a way that they can interact with human beings through wireless connection.

Q13: Describe advantages of cloud computing.

Ans. The advantage of cloud computing is that you do not have to buy and maintain a complex computer system. This cuts cost of buying computers and peripherals. Besides, you are not worried about equipment going out of date and other problems related with-system security and reliability.

Q14: Describe disadvantages of cloud computing.

Ans. The disadvantage of cloud computing is that it requires a reliable high speed broadband connection functioning the whole time you are working. Another disadvantage of cloud computing is the privacy and security risk of having valuable data on someone else's system in an unknown location.

Q15: Define data centers.

Ans. Data center is a centralized location for collecting, storing, processing and distribution of vast amount of data.

Q16: State the use of data center.

Ans. Organizations such as government agencies, banks, educational institution, telecommunication companies and social networking services use large amount of data and thus have requirement for data center. Many companies are moving their data centers to cloud services to cut the cost of running their own computing networks and servers.

Q17: Give some examples of computer hardware.

Ans. All physical components of computer system, such as monitor, keyboard, hard disk, printer, along with the circuitry connecting them are known as computer hardware.

Q18: What is the need of software?

Ans. A computer cannot do anything on its own. It must be instructed to do a desired job. Hence, it is necessary to specify a sequence of instructions, which a computer must perform to solve a problem.

Q19: Give some examples of software.

Ans. Word-processing software, spreadsheet software and database management software may contain many programs for creating, editing, formatting and printing different types of documents.

Q20: Name the types of computer software.

Ans. Computer software can be classified into the following types:

- System Software
- Application Software
- Internet Applications
- Licensed Software, Open Source Software, Shareware and Freeware

Q21: What is the purpose of system software?

Ans. The purpose of system software is to make the use of computer more effective and efficient. A computer without some kind of system software would be ineffective and impossible to operate.

Q22: Give some examples of system software.

Ans. Some examples of system software are:

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

Q23: Name some commonly used operating system.

Ans. Some commonly used operating systems are Windows, Linux, Mac OS and Android.

Q24: Which tasks are performed by operating system?

Ans. 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

Q25: What is meant by Plug n Play Devices?

Ans. 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.

Q26: Name few important utilities of windows.

Ans. A few important utilities are disk defragmenter, disk cleaner, file compression utilities, antivirus utility, file manager, network utilities and utilities to configure hardware devices.

Q27: Define assembler.

Ans. Assembler is software that translates assembly language program into machine language.

Q28: Define compiler.

Ans. 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.

Q29: Define interpreter.

Ans. 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.

Q30: Give some examples of application software.

Ans. Some examples of application software are:

- Productivity Software
- Business Software
- Entertainment Software
- Educational Software

Q31: What are the important internet applications?

Ans. Following are the important internet applications:

- Web Applications
- Cloud Computing Applications
- Social Media Network Applications

Q32: What is meant by web application?

Ans. A web application is a program that runs on a remote server while its users interact with it through a Web browser.

Q33: What is meant by copyright law?

Ans. The software license deals with the Copyright Law. Copyright law prevents illegal copying of computer software. It allows creators of computer software to benefit financially from their software and to retain some control over how it is used.

Q34: Name some examples of freeware.

Ans. Some examples of freeware are:

- Skype
- Viber
- Mozilla Web browser

Q35: Name some parts of Internet application security system.

Ans. Internet application security system consists of following programs:

- Firewalls
- Anti-Virus Programs
- Spyware Detection
- Removal Programs
- Encryption/Decryption Programs

Q36: Name some input devices.

Ans. Some input devices are as follows:

- Keyboard

- Mouse
- Joystick
- Microphone
- Image Scanners

Q37: Name some commonly used pointing devices.

Ans. Commonly used pointing devices are as follows:

- Mouse
- Trackball
- Joystick
- Touch Screen
- Light Pen
- Touch Pad

Q38: Write down the uses of scanners.

Ans. 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.

Q39: Name the different types of scanners.

Ans. There are different types of scanners like:

- Hand-Held Scanner
- Flatbed Scanner
- Barcode Reader

Q40: What are the uses of hand-held scanners?

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

Q41: What is meant by hardcopy?

Ans. The output generated on paper by an output device such as printer or plotter is called Hardcopy output.

Q42: What is meant by softcopy?

Ans. The output in the form of data or information stored on a storage device or displayed on a monitor is called Softcopy output.

Q43: Name common types of monitors.

Ans. The common types of monitors are as follows:

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

Q44: Write down few characteristics of printers.

Ans. Printers vary in their capabilities based on the following characteristics.

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

Q45: What are the main categories of printers?

Ans. There are two main categories of printers.

- Impact printers
- Non-impact printers

Q46: How many types of plotters are there?

Ans. Plotters are of two types, which are as follows:

- Flatbed Plotter
- Drum Plotter

Q47: Describe the use of speakers

Ans. Speakers are audio output devices that are attached to the sound card on motherboard. Speakers produce softcopy output in the form of voice.