FOUNDATION OF
INFORMATION TECHNOLOGY 9

Quarterly Test Paper

50 Marks

Internal Assessment
Based on Chapters 1–3

A. Very Short Answer Type Questions   (4 × 1 mark)

1. What is a computer?

Ans. A computer is an electronic device that takes input from the user in the form of data or instructions, processes the data according to the given instructions and generates the output.

2. Give one example of an input device.

Ans. Keyboard is an input device.

3. What is a CPU?

Ans. Central Processing Unit (CPU) is a physical device that controls computer operations.

4. Name a popular Web browser.

Ans. One popular Web browser is Google Chrome.

B. Short Answer Type-I Questions   (4 × 2 marks)

1. Define computer hardware. List any four hardware devices.

Ans. Computer hardware refers to the physical parts of the computer system that can be touched and seen. The following are some computer hardware devices:
- Keyboard
- Mouse
- Monitor
- Printer

2. Describe any three types of computer mouse.

Ans. A mouse is a basic input device of a computer that controls the movement of the cursor or pointer on the display screen. The following are the three types of mouse:
- **Mechanical Mouse:** Refers to a mouse in which the movement of cursor on the screen is relative to the movement of the ball at the base of the mouse. To use the mechanical mouse efficiently, we need a flat surface or mouse pad.
- **Optical Mouse:** Refers to a mouse that uses a Light Emitting Diode (LED) to detect the movement of cursor on the screen. This type of mouse does not work on a black or shiny surface.
- **Laser Mouse:** This type of mouse uses infrared laser diode for detecting the mouse movement.

3. What is the functionality of a language processor? Name the language processors used in a computer system.

Ans. A language processor is software that translates the language of any program into a format that a computer can understand, interpret and execute. The following language processors are used in a computer system:

❍ Assembler

❍ Compiler

❍ Interpreter

4. What is the difference between general purpose software and specific purpose software?

Ans. General purpose software is used to perform a wide variety of tasks and is commonly used by all types of computer users. On the other hand, a specific purpose software is designed to carry out the tasks related to a particular job role.

C. Short Answer Type-II Questions   (6 × 3 marks)

1. How does a computer work? Describe its functionality with a daily life scenario.

Ans. The working of a computer depends on the input-process-output model where the computer takes data from input devices, processes it and display the output. For example, when we want to prepare some cookies, first we take some raw ingredients such as flour and sugar (as an input), bake these ingredients with the help of an oven (as a process) and finally get the cookies (as an output).

2. Is scanner an input or output device? List different types of scanners with their features.

Ans. A scanner is an input device that scans images, printed text, or an object and converts it into a digital image. Instead of making a duplicate copy on a paper, the scanner stores the digital image in the computer memory. Different types of scanners are as follows:

❍ Hand-held Scanner

❍ Flatbed Scanner

❍ Drum Scanner

3. Describe the functionality of a control unit. How does the control unit compare two numbers?

Ans. The control unit extracts instructions from the computer memory, decodes and executes instructions and takes help of ALU, if required. It supervises and monitors the functions performed by the entire computer system. The control unit compares two numbers, say x and y, in the following manner:

1. The control unit determines the type of instruction by the Read x and y variables instruction. Once it makes sure that the instruction is an input type, it instructs input devices, such as keyboard or mouse to provide the appropriate value for x, say 10.

2. As the control comes to the next statement, if x>y ?, the control unit determines the nature of the statement—whether it is a comparison statement or some other statement.

3. Once the control unit makes sure that it is a comparison statement, then it instructs the ALU to check the comparison and produce the results. Then, the ALU returns the result to the control unit.

4. The control unit returns the result 'x is greater' when x>y statement is Yes. Otherwise, it returns the result 'y is greater'.

4. Describe the factors that affect the computer performance.

Ans. The following are some factors that affect the computer performance:

❍ **CPU Speed:** As all operations performed by a computer system are controlled by CPU, its performance depends on the CPU speed. Generally, the CPU speed is measured in Megahertz (MHz) or Gigahertz (GHz). The CPU speed determines the number of instructions processed by a CPU in one second. 1 gigahertz (GHz) CPU carries out 1 billion instructions per second.

❍ **Memory Size:** The computer has a memory to store or retrieve data. The CPU stores the frequently accessed data in Random Access Memory (RAM). Therefore, if we open an excel sheet, Internet and a music player simultaneously, these all get stored in the RAM and the CPU controls them. Therefore, the more the memory size, the more easily the data can be stored and retrieved.

○ **Number of Applications Running:** As we know, all the opened applications are stored in RAM. This implies that the speed of a computer slows down with the increase in the number of opened applications. Therefore, we should limit the number of applications that we are opening on our computer at one time to increase our computer performance.

5. Define computer software. Discuss its categories and sub-categories.

Ans. Computer software is a set of programs and data that gives instructions to a computer about what to do and how to do. A computer software can be categorized into the following categories:

○ System Software
  ● Operating System
  ● Language processor
  ● Device drivers
  ● Utility software
○ Application Software
  ● General purpose software
  ● Specific purpose software
  ● Customized software

6. How is system software differ from application software?

Ans. The software that is responsible for controlling a computer's internal operations, handling input/output devices and scheduling tasks is known as system software. Some common examples of system software are OS and device drivers. On the other hand, the software that defines a set of programs to perform some specific operations is known as application software. Some common examples of application software include word processing program, spreadsheet program, browser, and Personal Information Manager (PIM).

D. Long Answer Questions   (4 × 5 marks)

1. List any three features and two limitations of a computer.

Ans. The following are some qualities that facilitate such wide use and popularity of computers:

○ **Speed:** Computers perform at great speed and have the capability of processing even the most complex computations in a matter of seconds. Many computers have the ability to process billions or trillions of operations in a single second.

○ **Storage capacity:** The storage capacity of a computer defines how much information can be stored in it. Nowadays, storage capacity of hard disks can be in terabytes (TBs). This allows the user to store a large amount of data at a single location.

○ **Reliability:** The electronic components in modern computers make them more reliable as they rarely break or fail.
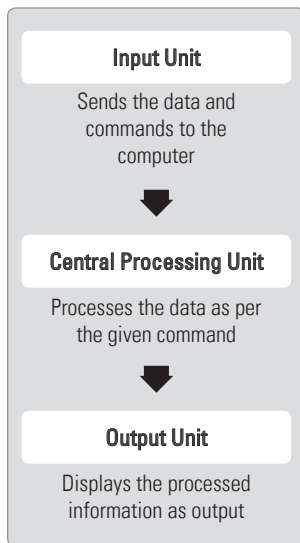
The following are the limitations of computers:

○ **No power to make decisions:** Computers are unable to take decisions on their own; instead, they depend upon the input being provided by humans.

○ **No IQ:** Computers are machines that do not have self-intelligence; instead, they need to be informed time to time regarding the tasks to be performed.

2. Explain the input-process-output model with an appropriate example.

Ans. A computer performs a task in the same manner as we do our day-to-day activities. For example, when we want to prepare some cookies, first we take some raw ingredients such as flour and sugar (as an input), bake these ingredients with the help of an oven (as a process) and finally get the cookies (as an output). In the same manner, the computer takes data from the input devices, processes it and displays the output.

The following figure shows the input-process-output model:

Input Unit
Sends the data and commands to the computer

▼

Central Processing Unit
Processes the data as per the given command

▼

Output Unit
Displays the processed information as output

As shown in the preceding figure, a computer follows the input-process-output model, where:

❍ **Input**: Refers to the process of feeding data or instructions in a computer

❍ **Process**: Refers to the work done by the computer with the help of hardware and software

❍ **Output**: Refers to the result that is obtained when the computer processes the input

3. Classify and explain the following devices:

❍ Mouse

❍ Monitor

❍ Digital Camera

❍ Printer

❍ Joystick

Ans. INPUT DEVICES

❍ **Mouse:** A mouse is a basic input device of a computer. It controls the movement of the cursor or pointer on the display screen. As we move the mouse on a plain surface, the pointer on the display screen also moves in the same direction. The mouse is particularly useful in a Graphical User Interface (GUI) where we can point to an option or object on the screen and click the appropriate mouse button. Some different types of mouse are mechanical mouse, optical mouse, laser mouse, etc.

❍ **Digital Camera:** A digital camera is an input device that is used to capture pictures and record videos. In principle, a digital camera is similar to a traditional film-based camera, Digital photography uses a combination of advanced image sensor technology and memory storage which allows images to be captured in a digital format. The captured images are instantly available to print with no need for a development process.

❍ **Joystick:** A joystick is a hand-held device that is used to control the movement of the cursor or other graphic elements in video games. The joystick is normally used for playing a video game, where a user needs to move the pointer quickly across the screen. We can move a joystick in four directions: left, right, up and down. It is also used for drawing objects in Computer-Aided Design (CAD).

OUTPUT DEVICES

❍ **Monitor:** A computer monitor is an output device that displays the computer's user interface and the information requested by the user. The term monitor is often used to refer to a computer screen as it displays programs, allowing the user to interact with the software. When a program is executed, the information is displayed on the monitor. The following are the three types of monitor: Cathode Ray Tube (CRT), Liquid Crystal Display (LCD) and Light Emitting Diode (LED).

❍ **Printer:** A printer is an output device that prints the data processed by a computer. After creating a document using the computer, we can send the document to the printer for printing. The printer generates a hard copy known as the printout of the document. It can print documents in colour as well as in black and white. The speed of a printer is normally rated either by pages per minute (ppm) or by characters per second (cps).

4. What is an antivirus? Why is antivirus software used in a computer? Give some examples of antivirus software.

Ans. Antivirus is a software program that protects our computer from unexpected virus attacks. A virus is a piece of programming code usually disguised as some other program or application that causes some unexpected and usually undesirable event. Viruses can be transmitted as attachments to an e-mail as downloads, or be present on a diskette or CD. Norton, McAfee, SmartCOP, Quick Heal, Kaspersky and Avast are some of the popular antivirus software.

Apart from protecting our system, antivirus software performs the following tasks:

❍ Detects the name of the virus and its type.

❍ Detects the name of the infected file or folder and mentions its exact location on our computer and removes the virus from the computer.

❍ Most of the antivirus software come with the 'Alert' feature. This feature keeps a vigil on our computer and as soon as any virus-like activity is found, it displays a message box and alerts the user.

❍ By changing the settings of antivirus software, we can instruct it to scan the computer on a regular basis.

❍ With regular updates, antivirus software protects our computer from new viruses.

Enrichment Activity   5 Marks
Internal Assessment

Start our computer and run the antivirus program installed in it. When the scanning process completes, check the messages displayed in the interface of the antivirus program and find out whether any viruses are detected in our computer. If yes, take the appropriate steps to remove them from our system.

Discuss the need to install and run an antivirus program periodically in a computer.

FOUNDATION OF
INFORMATION TECHNOLOGY **9**

Half-yearly Test Paper   **50 Marks**

Internal Assessment
Based on Chapters 1–6

A. Very Short Answer Type Questions   (4 × 1 mark)

1. What do you mean by computer hardware?

Ans. Computer hardware refers to the physical parts of a computer.

2. What is a mouse?

Ans. A mouse is a basic input device of a computer. It controls the movement of the cursor or pointer on the display screen.

3. Write the full form of WiMAX.

Ans. WiMAX stands for Worldwide Interoperability for Microwave Access.

4. Define a word processor program.

Ans. A word processor program is a computer application that is used to create, edit and organize a document.

B. Short Answer Type–I Questions   (4 × 2 marks)

1. Explain the need of creating a computer network.

Ans. The computer network is required for the following reasons:
- It allows users to share all types of data, such as text, audio, video, pictures and graphics.
- It reduces cost by sharing hardware and software resources.
- It saves time by transferring data from one computer to others.
- It provides high reliability because there are multiple sources of supply.
- It increases productivity by easy sharing of data.

2. Explain PCB in the context of job scheduling.

Ans. Process Control Block (PCB) refers to the data structure that represents or defines a process in an operating system. The PCB may be treated as a store that allows operating systems to locate key information about a process.

3. What do you mean by word wrapping?

Ans. The word wrapping is a feature of word application that facilitates automatic organization of the text into lines. It means users need not press the Enter key when they reach the end of a line.

4. Write the steps you will perform to reset the page size in an OpenOffice Writer document.

Ans. The following steps should be taken to reset the page size:
1. Select the **Format→Page** option from the Menu bar. The **Page Style: Default** dialog box appears.
2. Select the **Page** tab in the **Page Style: Default** dialog box.

3. Select the required page size option from the Format drop-down list under the Paper format section. A preview of the selected page size is displayed in the right corner of the Page Style: Default dialog box.

4. Click the OK button to close the Page Style: Default dialog box.

C. Short Answer Type–II Questions   (6 × 3 marks)

1. List the components of a computer network and explain their usage to facilitate communication between two parties.

Ans. The various components of the computer network are as follows:
- Sender
- Communication equipment at the sender's end (telephone)
- Communication channel (telephone cable)
- Communication equipment at the receiver's end (telephone)
- Receiver

The above listed components work in the following manner:
  i. The sender uses the communication equipment to speak, which in this case is the telephone.
  ii. The communication equipment of the sender converts the sender's voice into a signal, which is carried through the telephone cable.
  iii. The receiver receives the signal, which is converted from signal into voice.
  iv. The receiver listens to the voice of the sender with the help of the telephone at his/her end.

2. Write any four differences between the guided and unguided media.

Ans.

Guided Media	Unguided Media
It is also called wired media.	It is also called wireless media.
It transmits data through cables.	It transmits data through waves.
It is used in LANs.	It is used in WANs.
It provides more data transfer speed.	It provides less data transfer speed.

3. Describe the factors used to determine the scheduling techniques for producing the most beneficial results.

Ans. Some factors used to determine the scheduling techniques for producing the most beneficial result are as follows:
- CPU utilization
- Turnaround time
- Waiting time
- Response time
- Throughput

4. Describe the features of GNU Linux operating system.

Ans. Some of the distinct features of the GNU Linux operating system are as follows:
- **Open source operating system:** Anyone can freely use the Linux operating system. In other words, anyone can see its source code, modify it and redistribute it.
- **Virus free:** The Linux operating system rarely gets attacked by computer viruses. In contrast to other operating systems, Linux provides better security.

- ❍ **Stable, long-running operating system:** The Linux operating system almost never hangs up or hardly encounters system crashes. A user can run Linux for days and months together without any need for restart. This is why Linux is used in most of the Internet servers.
- ❍ **Multiple workspaces:** The Linux operating system allows users to use four desktop screens (known as workspaces) simultaneously. They can switch anytime from one workspace to the other. However, in other operating systems, such as Windows, there is only one desktop screen, and if it gets filled up, users have to clean it.
- ❍ **No constant rebooting:** It allows users to install and remove software without rebooting the computer.
- ❍ **Start/stop services:** It enables users to start and stop individual services, such as Web, file and e-mail services, without either rebooting the computer or interrupting the work of a user.
- ❍ **Portable software:** It modifies an application or driver to make it work on different computer architectures or operating systems.

5. What do you mean by wildcards? Describe the types of wildcards used in Linux.

Ans. A wildcard is a special character that is used to match multiple files and directories simultaneously in a search. The following two types of wildcards are used in Linux:
- ❍ **? (Question Mark):** Represents a single character that can occupy a position in a filename or filename extension.
- ❍ **(Asterisk):** Represents one or more characters. For example, to refer all the files with a name starting with the character A and ending with the file extension .doc, type the following wildcard expression:

    ls A*.doc

6. What do you mean by page orientation? What steps should you follow to set the page orientation in an OpenOffice Writer application?

Ans. Page orientation refers to the way a page is set to print, that is, either lengthwise or widthwise. Using the Page Style: Default dialog box, the page orientation can be set either portrait or landscape. The following steps are performed to set the page orientation:
1. Select the **Format⎵Page** option from the **Menu** bar. The **Page Style: Default** dialog box appears.
2. Select the **Page** tab in the **Page Style: Default** dialog box.
3. Select the required orientation by selecting either the Portrait or Landscape radio button of the Orientation group under the **Paper format** section.
   The preview of the selected page orientation is displayed in the right corner of the Page Style: Default dialog box.
4. Click the OK button to close the Page Style: Default dialog box.

D. Long Answer Questions   (4 × 5 marks)

1. What is RAM? Why is RAM used in a computer and what are its limitations? List different types of RAM.

Ans. RAM (Random-Access Memory) is the main memory used in a computer system. It is an integrated circuit that enables users to access stored data in a random order. RAM stores instructions from the operating system, application programs and data to be processed, so that they can be quickly accessed by the computer's processor. RAM is much faster to read from and write to than other kinds of storage, such as hard disk, floppy disk and CD-ROM in the computer. However, data stays in RAM only as long as the computer is turned on. When the computer is turned off, RAM loses its data.

The following are some limitations of RAM:

❍ As the computer is shut down, the data stored in RAM is removed.

❍ Stores limited or small amounts of data.

There are two types of RAM—Static RAM (SRAM) and Dynamic RAM (DRAM).

2. List and explain any five secondary storage devices that are used to store data permanently in a computer.

Ans. The five secondary storage devices which are used to store data permanently in a computer are as follows:

❍ **Floppy Disk:** A floppy disk is the oldest type of secondary storage device that is used to transfer data between computers as well as store data and information. A floppy disk, made up of a flexible substance called Mylar, consists of a magnetic surface that allows data storage. Its structure is divided into track and sectors. A track of a floppy disk consists of concentric circles, which is further divided into smaller sections, called sectors. The data is stored in these sectors. The maximum storage capacity of a floppy disk is 1.44 MB.

❍ **Hard Disk:** The hard disk in the system is known as the data centre of the PC. It is used to store all the programs and data. The hard disk is the most important storage type among various types of secondary storage devices used in a PC, such as CD, DVD and Pen Drive. The hard disk differs from other storage devices on three counts—size, speed and performance.

❍ **Solid State Drive:** Solid State Drive (SSD) is another storage device that does not contain any moving parts, such as spinning platters and heads; therefore, it is faster than hard disk drives. An SSD uses transistors to store data. In SSD, the information can be accessed immediately, because there is no latency time when data is transferred. For this reason, SSDs have greater stability and reliability than hard disk drives. Moreover, SSDs are more expensive than hard disk drives. In addition, SSDs store up to 4 TB of data.

❍ **Compact Disc:** A compact disc also known as CD is an optical media that is used to store digital data. The compact discs are cheaper than other storage devices, such as hard disk or RAM. The compact disc was developed to store and playback sound recordings. However later on, it came to be used as a data storage mechanism. CDs are categorized into the following types: CD-ROM, CD-R and CD-RW.

❍ **DVD:** DVD or Digital Versatile Disc is another optical storage device that was developed in 1995. A DVD can hold up to 4.7 GB data and is much faster than the CD-ROM. A DVD also known as Super Density Disc can store 17 GB of data. The three categories of DVDs are DVD-R, DVD-ROM and DVD-RW.

3. Explain the following short distance wireless media:

❍ Infrared

❍ Laser

❍ Bluetooth

❍ Wi-Fi

❍ Near Field Communication

Ans. ❍ **Infrared:** Infrared waves are the light waves of a lower frequency than those that the human eye can receive and interpret. In infrared wireless technology, the transmission of data takes place through infrared (IR) radiation. Infrared technology is used in most television remote control systems and with a standard called Infrared Data Association (IrDA), it is used to connect computers with peripheral devices. Infrared devices transfer data at a maximum speed of 4 Mbps and have a maximum distance of 1 meter.

❍ **Laser:** Laser transmission is unidirectional that requires a direct line-of-sight. Its speed is higher than a microwave. For transmission of data through laser, laser transmitter and a photosensitive receiver at each end (the sender and the receiver) are required. Generally, data transmission

through laser is referred to as point-to-point transmission. An example of laser transmission is a network between two buildings.

○ **Bluetooth:** It refers to a wireless technology that creates small wireless networks, called personal area networks (PANs) between PCs and peripheral devices, such as keyboard, mouse, printers, etc. Bluetooth was named after the 10th-century Danish king, Harald I Bluetooth. The Bluetooth wireless technology enables users to establish a wireless communication between any two Bluetooth devices, such as mobile phones, laptops, cameras, or modem stations without any cables. For example, a user can transfer data from his/her mobile phone to a laptop by connecting them via Bluetooth. The data transfer rate over the Bluetooth varies from 723 Kbps to 1 Mbps in a short range (the maximum range is 10 meters).

○ **Wi-Fi:** It stands for Wireless Fidelity. It connects a computer over the network without any wired connection between the sender and the receiver. To start working with Wi-Fi, a user needs the following:

  ● A broadband Internet connection

  ● A wireless router (to get the connection from ISP)

  ● A laptop having a wireless Internet card

○ **NFC or Near Field Communication:** It is a technology that facilitates wireless communication between devices like smartphones and tablets. NFC uses radio frequency identification (RFID) signals to transfer small amounts of data between two devices. It is a short range wireless link that consumes very less power (even less than that of a smartphone's battery). In fact, NFC is activated only when the devices are touched or brought very close to each other (within 4 cm). Unlike Bluetooth, no pairing of devices is required in NFC, making it very easy to use.

4. What is an operating system? Explain any five categories of an operating system.

Ans. Operating system is the most important type of system software. It acts as an interface between user and hardware resources of a computer system. It is in charge of controlling all the activities of a computer system. Needless to say, the operating system is a crucial software component of a computer. It performs the following basic and important operations in the computer:

○ Recognizes the input entered by the user (such as a key press or a mouse click)

○ Displays the generated output on the computer screen

○ Keeps a log of the files and directories on the hard disk

○ Manages the various peripheral devices of the computer (such as printers and scanners)

The five categories of operating system are as follows:

○ **Single-program operating system:** Executes only one program at a time. Only after the execution of the currently running program, does the next program starts executing.

○ Multiprogram or concurrent operating system: Allows the computer's CPU to execute more than one program simultaneously. A multiprogram operating system switches between different programs so fast that it appears as if they are being executed simultaneously. It is the multiprogram operating system that decides the sequence of execution of different programs.

○ **Time-sharing operating system:** Allows the concurrent use of a single computer by more than one user. In a time-sharing operating system, the processing of a task switches among various users based on the available time, which is controlled by the operating system.

○ **Multiprocessing operating system:** Executes multiple programs simultaneously on a computer that has several CPUs, such as mainframes and supercomputers. Multiprocessing operating systems are much more complicated than single-program operating systems as they are required to allocate resources (such as printers or disk drives) to complete processes in a reasonable manner.

○ **Real-Time Operating System (RTOS):** Refers to the operating system that is designed to provide immediate and accurate responses within the allocated time constraint.

Type the following text, with font size 10, in the same format in an OpenOffice writer document:

Computers

Computers have established themselves as an indispensable part in various segments of human life, such as business, academics, defence strategy, budgeting, research, engineering, medicine and space exploration.

Whether it is a small store or a large business house, computers are used everywhere. We depend on them for everything—from paying electricity bills to withdrawing money from bank and so on.

Today, we can access information on any topic instantly from any place with the help of computers. But, have you ever wondered how we are able to do so? This has become possible because of convergence of technologies. **Technological convergence has almost revolutionized our daily life by changing the nature and the means we adopt to deal with communication, work and entertainment.**

After typing the specified text in the document, perform the following tasks:

1. Remove the italic and bold styles from the paragraphs.
2. Change the title colour of the heading to orange and set its font size to 16.
3. Change the font size of all the paragraphs to 12.
4. Find out more about the topic 'Technological Convergence' on the Internet and add a new paragraph about it in the document.

FOUNDATION OF
INFORMATION TECHNOLOGY (9)

Pre-annual Test Paper
Internal Assessment

50 Marks

A. Very Short Answer Type Questions   (4 × 1 mark)

1. Define software.

Ans. Software can be defined as a set of programs necessary to carry out operations for a specified job.

2. What is the maximum storage capacity of a floppy disk?

Ans. The maximum storage capacity of a floppy disk is 1.44 MB.

3. List four types of margins in a word processor.

Ans. The four types of margins are left margin, right margin, top margin and bottom margin.

4. What is a slide show?

Ans. A slide show is defined as an electronic presentation, which can be run on the screen of the computer system or any projection device.

B. Short Answer Type–I Questions   (4 × 2 marks)

1. Define ICT. List any two benefits of ICT in the domain of education.

Ans. ICT is known as Information and Communications Technology, which emphasizes on imparting knowledge in the field of education. It helps individuals or institutions handle information by using computers and other digital technologies. The following are the benefits of ICT in education:
- ❍ The use of computers in the education domain has simplified the learning of students.
- ❍ By using ICT, teachers of primary and secondary schools have made the learning of students interactive and enjoyable.

2. Describe the keys of the keyboard that are used to move within a table.

Ans. The following keys help us move in a table:
- ❍ **Tab:** Press the Tab key to move one cell to the right.
- ❍ **Shift+Tab:** Press the Shift+Tab to move one cell to the left.
- ❍ **Up Arrow:** Press the up arrow button to move up by one row.
- ❍ **Down Arrow:** Press the down arrow button to move down by one row.

3. Why are the track changes enabled in a document?

Ans. It is possible that an OpenOffice Writer document may be edited by multiple users. To track or record the changes of each user, the OpenOffice Writer provides the functionality for tracking changes. When this functionality is enabled in a document, all the previous versions of the document are viewed. By previous versions, we mean that the document maintains all types of changes that have been made by any user who has worked on that document. These changes can be either accepted or rejected.

4. List the options of the horizontal text alignment in an OpenOffice Calc application.

Ans. The following are the various options of the horizontal text alignment:
- **Default:** Aligns text to the left and numbers to the right
- **Left:** Aligns the cell data to the left
- **Right:** Aligns the cell data to the right
- **Center:** Places the cell content at the centre horizontally
- **Justified:** Aligns the cell data with the left and right cell borders
- **Filled:** Repeats the cell data until the visible area of the cell is filled

C. Short Answer Type–II Questions   (6 × 3 marks)

1. What do you mean by packages? Describe any three packages.

Ans. General purpose application software are known as packages. Some of the packages are as follows:
- Word Processing Program
- Spreadsheet Program
- Database Program
- Browser
- Personal Information Manager (PIM)

2. List the advantages and disadvantages of customized software.

Ans. The advantages of using customized software are as follows:
- The software possesses only those features that are required by an organization.
- The software works according to the business needs of an organization.
- It is better to opt for customized software than buy new software because it can be customized to fulfill the different needs of an organization.

Customized software has the following disadvantages:
- It takes a long time to develop customized software.
- A lot of money is needed to develop customized software.
- A team of business analysts, programmers and testers is required to build a customized application.

3. Describe the features and limitations of a computer.

Ans. The following are some features of a computer:
- **Speed:** Computers perform at great speed and have the capability of processing even the most complex computations in a matter of seconds. Many computers have the ability to process billions or trillions of operations in a single second.
- **Storage capacity:** The storage capacity of a computer defines how much information can be stored in it.
- **Reliability:** The electronic components in modern computers make them more reliable as they rarely break or fail.

The following are the limitations of computers:
- **No Power to Make Decisions:** Computers are unable to take decisions on their own; instead, they depend upon the input being provided by humans.
- **No IQ:** Computers are machines that do not have self-intelligence; instead, they need to be informed from time to time regarding the tasks to be performed.
- **No Heuristics:** Computers are not able to learn from their past experiences. It implies that when a computer commits an error once, then it would commit the same mistake again in a similar situation.

4. Define the following terms:
   ○ Spreadsheet application
   ○ Spell Check
   ○ IPR
   ○ Comment

Ans. ○ **Spreadsheet application:** It is an application that is mainly used for manipulating and arranging data in a grid of rows and columns.

○ **Spell Check:** It is a utility that checks the spelling and grammar mistakes in a document. The Writer application contains built-in dictionaries that help spell check a document.

○ **IPR:** It stands for Intellectual Property Rights. These are laws introduced to protect an author's rights and safeguard his/her intellectual property.

○ **Comment:** The text remarks given by the author/developer/editor on a program or document for exchanging ideas, giving suggestions, etc.

5. Write a note on the following:
   ○ Twisted-pair cable
   ○ Microwave
   ○ Infrared

Ans. ○ **Twisted-pair cable:** It contains two twisted wires that use copper as a conductor. These wires have plastic insulation and are twisted. The cable wires are twisted to provide protection against crosstalk and noise.

○ **Microwave:** It refers to a radio system that uses high frequencies to send and receive data or information. Due to high frequencies, microwave stations are located about 30 kilometers apart. The microwave media follow the line-of-sight transmission. In the line-of-sight transmission, data signal is transmitted in a straight line.

○ **Infrared:** Infrared waves are the light waves of a lower frequency than those that the human eye can receive and interpret. In infrared wireless technology, the transmission of data takes place through infrared (IR) radiation. Infrared technology is used in most television remote control systems and with a standard called Infrared Data Association (IrDA), it is used to connect computers with peripheral devices.

6. Describe any three types of operating system.

Ans. Broadly, operating systems can be classified into seven categories. Some categories are as follows:

○ **Single-program operating system:** Executes only one program at a time. Only after the execution of the currently running program does the next program starts executing.

○ **Multiprogram or concurrent operating system:** Allows the computer's CPU to execute more than one program simultaneously. Actually, only one program is executed at a time. But a multiprogram operating system switches between different programs so fast that it appears as if they are being executed simultaneously. It is the multiprogram operating system that decides the sequence of execution of different programs.

○ **Time-sharing operating system:** Allows the concurrent use of a single computer by more than one user. In a time-sharing operating system, the processing of a task switches among various users based on the available time, which is controlled by the operating system. Each active user is given a certain time slot to share the CPU to execute a task. However, if this time slot is elapsed or the I/O operation is interrupted (due to the execution of another task that is high on priority), then the CPU switches to execute the priority task and, the task being executed currently is put on hold.

D. Long Answer Questions

1. What do you understand by job scheduling in an operating system? Explain the various types of job scheduling techniques.

Ans. Job scheduling is the activity or method of assigning priorities to different jobs to be executed by the CPU. In other words, it is decided through job scheduling when a particular job will receive the CPU or computer resources it needs for its completion. So, the start of a job execution depends on job scheduling. Job scheduling techniques are of the following two types:

❍ **Non-preemptive scheduling:** A job scheduling technique in which the processing or execution of a job given to the CPU cannot be interrupted until the job is complete is known as non-preemptive scheduling. Non-preemptive scheduling decisions are always made after the completion of a job. Some non-preemptive scheduling techniques are as follows:

  ● **First-Come-First-Served (FCFS) scheduling:** It is also known as First-In-First-Out (FIFO) scheduling. FCFS scheduling simply means that the jobs would get the CPU time according to the order in which they arrive.

  ● **Shortest Job Next (SJN) scheduling:** It is also called Shortest Process Next (SPN) scheduling. In SJN scheduling, the job with the shortest execution time is given priority in execution.

  ● **Deadline scheduling:** Refers to a technique in which the job with the earliest deadline is selected first and assigned the CPU time.

❍ **Preemptive scheduling:** It is a scheduling technique in which a running job can be interrupted to execute some other job in order to improve the throughput. An example of preemptive scheduling is round-robin scheduling. It refers to a technique in which each job is executed at least once. This technique ensures that no job gets a second opportunity for execution unless all the other jobs are executed at least once. The round-robin scheduling technique is mainly used in time-sharing operating systems.

2. Write one advantage and one disadvantage of each of the following:

   a. Keyboard

   b. Light Pen

   c. Bar Code Reader

   d. Web Camera

   e. Inkjet Printer

Ans. **a.** **Keyboard:** A computer keyboard looks like a typewriter. Besides the normal alphabet keys, it also has a numeric keypad located to its right. The keyboard that we use is also known as the QWERTY/Universal keyboard. The following are some of the advantages and disadvantages of a keyboard:

Advantage of a Keyboard	Disadvantage of a Keyboard
Reliable and easy to input text and numbers	Difficult to enter specific type of data, such as pictures, diagrams and voice

   b. **Light Pen:** The light pen is a pointing device that uses a photoelectric (light sensitive) cell to indicate a position on the computer screen. When a user keeps the pen in front of an icon of the computer screen, say the Start button, it senses the light and the photoelectric cell gets activated. A pulse is generated and the electric response is transferred to the CPU which recognizes the point to which the light pen is pointing. After the CPU recognizes the point, the user can perform the click operation by pressing the pen on the computer screen. The following are some advantages and disadvantages of a light pen:

Advantage of a Light Pen	Disadvantage of a Light Pen
Very simple to use	Difficult to draw an accurate image

c. **Bar Code Reader:** A bar code reader is an input device that is used to read information encoded on a bar code. The bar code reader is also known as price scanner or point of sale (POS) scanner. A bar code is an optical machine-readable code, which is printed on various types of products. It holds necessary information about the product. Today, bar codes are used to update inventory and ensure correct pricing. The following are some advantages and disadvantages of a bar code reader:

Advantage of a Bar Code Reader	Disadvantage of a Bar Code Reader
Easy, fast and reliable way to input data	The cost for implementing a bar code reader is more as the user needs an inventory tracking software and barcode scanning hardware

d. **Web Camera:** The device that is used to capture the real time image and provide the captured image on the computer of the other person (engaged in the communication), is known as a Web camera. The following are the advantages and disadvantages of a Web camera:

Advantages of a Web Camera	Disadvantages of a Web Camera
Makes video chatting and video conferencing possible	Picture quality is poor as compared to a digital camera

e. **Inkjet Printer:** Inkjet printer has several tiny nozzles that spray ink onto the paper. Each nozzle is thinner than hair. The print head of the inkjet printer is known as print cartridge. The print cartridge contains nozzles and ink. Therefore, when no more ink is left, the entire print cartridge needs to be replaced. The following are some advantages and disadvantages of the inkjet printer:

Advantages of an Inkjet Printer	Disadvantages of an Inkjet Printer
Does not make noise	The ink used is very costly

3. What is a presentation? Write the steps involved in creating a new presentation in OpenOffice Impress.

Ans. Presentation, as the name suggests, refers to the way of presenting information to a group of people. It is a sequential collection of slides in which each slide displays information in the form of text or graphics. Users can present any kind of information by means of presentation, such as explaining a new concept to the employees of a company, presenting an idea to clients, or teaching students in a class.

In OpenOffice Impress, a new presentation can be created by using two options, namely the Empty presentation option and the From Template option available in the Presentation Wizard. Perform the following steps to create an empty presentation:

1. Select the Applications W Office W OpenOffice 4.1.1 Impress option to start the Impress application. The Presentation Wizard appears.
2. Select the Empty presentation radio button in page 1 of the Presentation Wizard.
3. Click the Next button to move on to the next page in Presentation Wizard. Page 2 of the Presentation Wizard appears.
4. Select the Presentation Backgrounds option from the drop-down list under the Select a slide design section in Presentation Wizard to change the background of slides. A list of related options appears in the list box.
5. Select the desired option from the list box to set a background for the slides. In our case, we have selected the <Original> option.

6. Select the desired radio button under the Select an output medium section to select the output medium for the presentation. Generally, presentations are created to be displayed on the computer screen. Therefore, we have selected the Screen radio button.

7. Click the Next button to move on to the next page in Presentation Wizard. Page 3 of the Presentation Wizard appears.

8. Select the desired effect for the slide from the Effect drop-down list under the Select a slide transition section. In our case, we have selected the Wipe Right effect.

9. Select the desired speed for the selected effect from the Speed drop-down list under the Select a slide transition section.

10. Select either the Default or Automatic radio button under the Select the presentation type section to select whether or not the presenter changes the slide manually or it happens automatically. In our case, we have selected Default.

11. Click the Create button in the Presentation Wizard. An empty presentation is created.

4. Define charts. Explain any five types of charts available in OpenOffice Calc.

Ans. Charts or graphs are pictorial representations of data that have always been considered as good mediums to attract the attention of readers or viewers. A user can easily explain an idea or concept by presenting it in the form of a chart. A chart is a medium that is used to graphically present worksheet data in Calc. A chart is the best way to compare and show the relationship between two data items, such as the sales volume of a product in two years.

OpenOffice Calc provides different types of charts to present the worksheet content in different ways. Calc supports the following charts:

❍ **Column Chart:** A column chart is used to emphasize the comparison of data items within a specified time period. To highlight the changes within a specified time period, the column chart organizes the values vertically and categories horizontally.

❍ **Bar Chart:** A bar chart is used to demonstrate comparison among individual items. It is mainly used to highlight a comparison of values; therefore, it organizes values horizontally and categories vertically.

❍ **Pie Chart:** A pie chart is a round chart that is divided into zones, which demonstrate the proportional size of an item with respect to the sum of all the items. The pie chart only displays one data series. Another variation of the pie chart is doughnut/donut chart which is used to display data in a proportional manner with more than one data series. The doughnut chart is similar to the pie chart except that it has a hole in its centre.

❍ **Area Chart:** An area chart is generally used to highlight change over time. This chart also depicts the relationship of parts to a whole by displaying the sum of plotted values. There are three types of area charts – Normal, Stacked and Percent Stacked.

❍ **Line Chart:** A line chart is a type of graph that displays data trends at regular intervals. It is a basic type of chart that is used to highlight the changes that occur in a value within a specified period of time. It contains a series of points that signify individual measurements with line segments.

Create a PowerPoint presentation in Impress with the slides in the given order:

Slide 1 Name of Your School	**Slide 4** Admission Procedure
Slide 2 About the School	**Slide 5** Extra-curricular Activities
Slide 3 Academic Facilities	**Slide 6** Contact Information
Slide 7 Thank You	

Add the appropriate images and content on the slides and show your presentation in the class.

FOUNDATION OF
INFORMATION TECHNOLOGY 9

Annual Test Paper   80 Marks

A. Very Short Answer Type Questions   (4 × 1 mark)

1. What is a laptop?

Ans. A laptop is a portable computer that is integrated with a display screen, keyboard, trackball, processor and memory.

2. What is an operating system?

Ans. An operating system (OS) is a program or software that manages and coordinates the functions of all the components of a computer.

3. Why is the AVERGAE() function used?

Ans. The AVERAGE() function is used to get the average (arithmetic mean) of all the passing arguments.

4. What is the full form of ICT?

Ans. The full form of ICT is Information and Communications Technology.

B. Short Answer Type–I Questions   (8 × 2 marks)

1. List two applications of a computer in the field of education.

Ans. The two applications of a computer in the field of education are as follows:
- Computers are extensively used in classrooms, libraries and laboratories for preparing reports, displaying information, developing projects and providing interactive learning aids.
- It is also possible to create virtual classrooms through computers if the instructor and students are situated in two separate geographical regions and read magazines and journals online.

2. List two advantages and disadvantages of a joystick.

Ans. The following are the two advantages of a joystick:
- It is simple and easy to use.
- It is not expensive.

The following are the two disadvantages of a joystick:
- Some joysticks have only limited features, such as forward, backward, left and right.
- Repetitive use of joystick can cause hand injury.

3. What is the use of a spreadsheet program?

Ans. A spreadsheet program allows us to organize, analyze and store data in a tabular format. It provides the basic arithmetic and mathematical functions. Modern spreadsheets also contain various built-in functions for common financial and statistical operations.

4. Name two types of twisted pair cables.

Ans. Two types of twisted pair cables are:
- **Shielded Twisted Pair (STP) Cable:** This cable has a metal shield covering each pair of insulated wires.
- **Unshielded Twisted Pair (UTP) Cable:** It is the most commonly used cable. It is used in Ethernet networks and telephone systems.

5. Define throughput. How is it calculated?

Ans. Throughput is defined as the amount of work that the CPU can do during a given time period. The formula to calculate throughput is as follows:

Throughput = Number of jobs finished/Time taken to finish the jobs

6. Discuss the usage of the mail merge feature.

Ans. Mail merge is used to automatically generate a set of documents, such as a form, letter or label containing similar information that can be sent to different persons/customers with ease.

7. What do you mean by cell referencing in a worksheet?

Ans. Cell referencing is the method by which we refer to a cell or series of cells in a formula. Cell referencing is of three types: relative cell referencing, absolute cell referencing and mixed cell referencing.

8. List two benefits of ICT in governance.

Ans. The following are the two benefits of ICT in governance:
- Governments use ICT to deliver public services. For example, a number of public services are now available online. Citizens and businesses are able to use the Internet to file tax returns, apply for immigration visas, renew vehicle road tax, or apply for passports.
- Use of ICT by governments has resulted in enhanced governance practices such as controlling bad practices like corruption in government offices or in various government departments using electronic devices.

C. Short Answer Type–II Questions   (10 × 3 marks)

1. Define technological convergence. List the 3Cs of technological convergence.

Ans. Technological convergence is defined as a practice by which information technology, telecommunication and media sectors that previously functioned autonomously are brought together to work on a common platform. The 3Cs of technological convergence are as follows:
- Computing
- Content
- Communications

2. What is a price scanner? How does it work?

Ans. A price scanner, also called bar code reader or POS scanner, is an input device that is used to read information encoded on a bar code. A bar code is an optical machine-readable code, which is printed on various types of products. It holds necessary information about the product.

The bar code reader reads the Universal Product Code (UPC), a pattern of bars printed on the product to be sold, with the help of a laser beam. As the laser beam reflects at the bar code image on the product, a light sensitive detector of the bar code reader gets activated and recognizes the image by its special bars. Once the bar code is recognized, the bar code pattern is changed to the numeric code. The bar code reader may be a handheld unit or embedded in a countertop.

3. List the differences between a compiler and an interpreter.

Ans. The following table lists the differences between a compiler and an interpreter:

Compiler	Interpreter
It is good for long programs.	It is good for short programs.
It occupies less space in the primary memory.	It occupies more space in the primary memory.
It takes more processing time.	It takes less processing time.
It translates the entire program at one go.	It translates a program line-by-line.
It displays the error (if any) after finishing the compilation of the entire source program.	It displays the error (if any) after finishing the compilation of a statement of the source program.

4. Define the following terms:
   ○ Internet
   ○ InterSpace
   ○ Multimedia

Ans. The above terms are defined as follows:
   ○ **Internet:** It refers to a collection of an infinite number of computers spread across the world. It is the largest computer network (a group of interconnected computers that can interact with one another) in the world. The Internet is also called a network of networks as it encompasses many small, medium and large networks.
   ○ **InterSpace:** It is a client/server program that allows multiple users to communicate online with real-time audio, video and text chat in dynamic 3D environments. It is the future vision of Internet as it provides the most advanced form of communication.
   ○ **Multimedia:** It is defined as the combination of text, graphics, sound, special effects and animation. Generally, multimedia is everything that we can see and hear.

5. Define the following terms:
   ○ Throughput
   ○ CPU idle time
   ○ Waiting time

Ans. The above terms are defined as follows:
   ○ **Throughput:** It is the amount of work that the CPU can do during a given time period. It is calculated by dividing the total number of jobs taken up by the CPU by the total time taken to complete the jobs.
   ○ **CPU idle time:** It is the waiting time the CPU to wait for an I/O operation to complete before it can take up the next job while executing jobs.
   ○ **Waiting time:** It is the amount of time during which a process needs to wait in the ready queue (a queue where jobs that want to use CPU time are lined up).

6. What is the difference between the preemptive and non-preemptive scheduling? Give examples of each type of scheduling.

Ans. Preemptive scheduling is a scheduling technique in which a running job can be interrupted to execute some other job in order to improve the throughput. An example of preemptive scheduling is round-robin scheduling. On the other hand, a job scheduling technique in which the processing or execution of a job given to the CPU cannot be interrupted until the job is complete is known as non-preemptive scheduling. Non-preemptive scheduling decisions are always made after the completion of a job. Common examples of non-preemptive scheduling include FCFS, SJN, and deadline scheduling.

7. List any three features of a word processor.

Ans. Some of the useful features of a word processor are listed as follows:
   ○ **Easy editing:** The word processor allows us to perform all types of editing tasks in a text document, such as insertion, deletion and modification.
   ○ **Permanent storage:** The word processor saves our text document. We can access our saved document whenever we need it.
   ○ **Simple formatting:** The word processor enables us to format our document easily. For example, we can change the text of our document to bold, italic or different fonts.

8. What do you mean by non-printing characters? Give some examples.

Ans. Non-printing characters are characters that are replaced by spaces in the printing process. The following are the non-printing characters:

❍ **Paragraph Mark (¶):** Refers to a mark that is added in a text document when we press the Enter key.

❍ **Space Mark (.):** Refers to a mark that is added in a text document when we press the Spacebar key.

❍ **Tab Mark (→):** Refers to a mark that is added in a text document when we press the Tab key.

9. Discuss the usage of the following types of charts used in OpenOffice Calc application:

❍ Bar chart

❍ Bubble chart

❍ Line chart

Ans. The charts are described as follows:

❍ **Bar chart:** A bar chart is used to demonstrate comparison among individual items. It is mainly used to highlight a comparison of values; therefore, it organizes values horizontally and categories vertically.

❍ **Bubble chart:** A bubble chart is used for representing relations among three variables. The two variables in the bubble chart are used for representing the position on the X-axis and Y-axis, while the third variable is used for representing the relative size of each bubble.

❍ **Line chart:** A line chart is a type of graph that displays data trends at regular intervals. It is a basic type of chart that is used to highlight the changes that occur in a value within a specified period of time. It contains a series of points that signify individual measurements with line segments.

10. What do you mean by hacking and piracy? Discuss the various forms of software piracy.

Ans. Hacking refers to unauthorized access to another person's computer to steal or destroy crucial data or information. A person who does hacking is called a hacker.

Piracy refers to the act of creating duplicate copies of software without the owner's permission. The following are various forms of software piracy:

❍ **Softlifting:** Purchasing a licensed copy of software and uploading it on several computers by violating the software license terms and conditions

❍ **Uploading and downloading:** Creating copies of the licensed software or uploading and downloading it from the Internet

❍ **Software counterfeiting:** Selling and making replicas of the licensed or copyrighted software illegally

❍ **Hard disk loading:** Installing an illegal copy of software on the hard disk of a personal computer

❍ **Renting:** Giving or selling licensed software to other persons for temporary use

D. Long Answer Questions   (6 × 5 marks)

1. Write the steps involved in inserting a row in a table in OpenOffice Writer.

Ans. While inserting data in a table, we might need more rows to finish our work. Perform the following steps to insert a row in a table:

1. Right-click the cell which we want to insert a row. A context menu appears.

2. Place the cursor on the Row option. A submenu appears.

3. Click the Insert option in the sub-menu. The Insert Rows dialog box appears.

4. Click the up or down arrow beside the Number spin box to add the required number of rows.

5. Select the radio button beside the Before or After option in the Position section according to the requirement.

6. Click the OK button. The specified number of rows are added.

2. Discuss the various types of cell referencing with appropriate examples.

Ans. Cell referencing is of the following three types:

❍ **Relative cell referencing:** In relative cell referencing, when a formula is copied to a new location in a worksheet, cell references in the formula change in relation to the new location of the formula. For example, a formula (=B3*C3) placed in cell D3 multiplies the values of cells B3 and C3. In relative cell referencing, if we copy the formula (=B3*C3) in a cell other than cell D3, its interpretation, that is, multiplying the values of two cells, gets copied in the new cell. It implies that the cell references in the formula (=B3*C3) change in relation to the new location of the formula, and the calculation is done according to changed cell references.

❍ **Absolute cell referencing:** In absolute cell referencing, cell references in a formula remain the same even when the formula is copied to a new location. For absolute cell referencing, we need to use the $ (dollar) symbol as prefix before the column and row names in a formula. The formula D3 (=B3*C3), used in the above example of relative cell referencing, will change to the formula D3 (=B3*C3) for absolute cell referencing.

❍ **Mixed cell referencing:** A cell address has two parts—first is the column letter and second is the row number. If we put the $ sign before both these parts (row number and column letter), the cell address becomes an absolute cell reference. When we do not put the $ sign before any of the parts, the cell address remains a relative cell reference. However, if we use the $ symbol with only one part of the cell address, either with the column letter or the row number, it is called the mixed cell referencing. In mixed cell referencing, one part of the cell address is an absolute reference while the other part is a relative reference. For example, in cell address D$3, column D is a relative reference while row 3 is an absolute reference. In mixed cell referencing, the formula D3 (=B3*C3) may be written as D3 (=B$3*C3).

3. Define the concept of Information and Communication Technology (ICT). List some applications of ICT in:

❍ Education

❍ Health care

❍ Governance

❍ Business

❍ Design and manufacturing

Ans. ICT is known as Information and Communications Technology, which emphasizes on imparting knowledge in the field of education. It helps individuals or institutions handle information by using computers and other digital technologies. ICT has wide scope in various fields, such as education, healthcare, governance, design and manufacturing, and business. Let's now explore the benefits of ICT in these fields.

Benefits of ICT in Education

Nowadays, teachers often use computers (electronic media) to teach students. The following are the benefits of ICT in education:

❍ The use of computers in the education domain has simplified the learning of students.

❍ By using ICT, teachers of primary and secondary schools have made the learning of students interactive and enjoyable.

❍ Generally, students find images and pictorial representations of concepts more interesting as compared to theoretical knowledge. Therefore, teachers explain complex topics in a simplified manner by using images, videos and simulations.

Benefits of ICT in Health care

The benefits of ICT in health care are as follows:

❍ ICT has significantly reduced the cost and enhanced the services being provided. Today, doctors can take the advice of other doctors residing in other countries by using videoconferencing instead of meeting them personally.

❍ The use of ICT in the health care industry has given birth to a new concept, i.e. e-health. It refers to the management of records and information of patients electronically. E-health allows patients to download reports and schedule an appointment with doctors.

Benefits of ICT in Governance

The following are the benefits of ICT in governance:

❍ Governments use ICT to deliver public services. For example, a number of public services are now available online. Citizens and businesses are able to use the Internet to file tax returns, apply for immigration visas, renew vehicle road tax, or apply for passports.

❍ Use of ICT by governments has resulted in enhanced governance practices such as controlling bad practices like corruption in government offices or in various government departments using electronic devices.

Benefits of ICT in Business

The following are the benefits of ICT in business:

❍ Nowadays, people in business can store data not only in their computers, but also in external storage devices, such as online servers in case of huge generation of data. The data stored is accessible to people irrespective of their geographical location.

❍ It provides quick and cost-effective communication. For example, a meeting of the employees of various branches can be done by video conferencing.

Benefits of ICT in Design and Manufacturing

The use of ICT in the design and manufacturing industry led to the introduction of Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM). CAD allows designers to develop detailed designs of products and CAM is used to manufacture accurate components of products with minimum tolerance. The benefits of CAD and CAM are as follows:

❍ In CAD, errors in design can be detected quickly, resulting in less time in manufacturing a product.

❍ The company can have bigger profit margins by using CAM as there is no labour cost.

4. What do you understand by a computer? Discuss any five types of commonly used computing devices.

Ans. A computer is an electronic device which is used to perform a variety of operations on the basis of a set of instructions called program. A computer takes input from the user in the form of data or instructions. On receiving the instructions from the user, the computer processes the data and generates some output and displays it to the user. When the computer processes data, it becomes information. Depending upon their accessibility, portability and user-friendliness, computing devices can be classified into many categories. The following are some of the commonly used computing devices:

❍ **Desktop Computer:** A desktop computer is primarily used in an office or home. It can be used independently of any other computer; therefore, this computer is also called Personal Computer (PC).

❍ **Personal Digital Assistant:** A Personal Digital Assistant (PDA) is a lightweight, hand-held computer designed to be used as a personal organizer. A typical PDA does not contain a conventional keyboard; instead, it relies on recognition of handwritten input through the use of Stylus (a special type of pen used to write text and select options on the LCD screen).

- ❍ **Laptop:** A laptop is a portable computer that is integrated with a display screen, keyboard, trackball, processor and memory. The entire machinery of a laptop runs on a rechargeable battery. We can carry a laptop anywhere; therefore, we do not have to stick at one place to work on a computer.
- ❍ **Tablet:** A tablet is a kind of microcomputer which offers a host of new features to the IT-savvy world. With its electromagnetic pen, touch screen and software that recognize letters written on a screen, a tablet can be called a notepad of the 21st century. The pen can act as a mouse when moving over a tablet. When the pen touches the screen, it acts as an ink pen and the user can write directly on the screen.
- ❍ **Smartphone:** A smartphone is basically a mobile phone that provides additional features to perform day-to-day tasks. These features include sending mails and accessing the Internet. In smartphones, we find a built-in camera and music player. We can perform almost all tasks of a desktop computer with smartphones.

5. List and explain the different types of programming languages.

Ans. A computer understands nothing but the instructions given by a programmer in a predefined format, known as the programming language. Every programming language includes a set of instructions or commands, known as a program, to make the computer perform various types of tasks. Programming languages can be classified into the following four generations:

- ❍ **First Generation Languages (Machine Languages):** Machine languages are categorized as first generation languages (1GLs). Earlier, programmers used to give instructions to the computer in the machine-readable format (also known as the binary format) and hence the language was called machine language. In machine language, instructions contain long strings of 0s and 1s, making a program fragment look something like "010101010110". This sequence of 0s and 1s may be incomprehensible to us, but it carries a significant meaning for a computer.
- ❍ **Second Generation Languages (Assembly Languages):** To overcome the difficulties of machine language, a new language, known as assembly language (or symbolic programming language), was introduced. The syntax of an assembly language is similar to that of the English language and is in a human readable format. The main purpose of this language is to establish coordination between man and machine. It is a low-level language written by using nemonics and requires an assembler for binary conversion of instructions.
- ❍ **Third Generation Languages (High-level Languages):** Third generation programming languages are also known as high-level languages. 3GLs are simple to understand by humans, as they include easy-to-learn syntax. Fortran, ALGOL, C, COBOL, C++ and Java are some examples of high-level languages of the third generation. 3GLs do not directly interact with the computer as they are independent of the internal machine code.
- ❍ **Fourth Generation Languages:** The term '4GL' was invented by J. Martin to refer to non-procedural high-level languages. As compared to 3GL procedural languages, 4GL languages require fewer number of lines to develop a program. The languages of the fourth generation focus on WHAT to do rather than HOW to accomplish a given task. These languages provide us several built-in functions, such as print( ), open( ) and close( ), which help us perform most of the essential tasks. This means that a programmer using a 4GL just needs to decide the tasks that must be performed by the program; the rest is taken care of by the predefined built-in functions.

6. Explain the various types of networking cables used for connecting computers.

Ans. Computers in a small network known as Local Area Network (LAN) can be connected through cables. Mostly copper conductors, such as twisted pair or coaxial cables are used to connect computers in a LAN. Nowadays, optical fiber technology is also used for networking in LANs. Guided media transmit data through cables. The various types of networking cable are as follows:

- ❍ **Twisted Pair Cable:** It contains two twisted wires that use copper as a conductor. These wires have plastic insulation and are twisted. The cable wires are twisted to provide protection against crosstalk and noise. The twisted pair cable is of two types:

- **Shielded Twisted Pair (STP) Cable:** This cable has a metal shield covering each pair of insulated wires. The STP cable is created by the IBM.
- **Unshielded Twisted Pair (UTP) Cable:** It is the most commonly used cable. It is used in Ethernet networks and telephone systems.

○ **Coaxial Cable:** It consists of two conductors. The first conductor is the inner conductor of solid copper (also called the core conductor). The second conductor is the outer conductor. The outer conductor serves as a shield against noise. There is an insulating plastic between the conductors and the whole cable is covered with a plastic jacket. Coaxial cables can carry signals of higher frequency ranges than twisted pair cables. Coaxial cables are used in cable TV network and traditional Ethernet LANs.

○ **Fiber Optic Cable:** It is a type of cable that contains one or more optical fibers coated with plastic layers. Due to their greater bandwidth, these cables can carry more data. These cables are thinner and lighter than metallic cables.