Chapter 3: Exploring Computer Software

Solutions

Summative Assessment

Multiple-Choice Questions (MCQs)

1. Which among the following is an operating system?
   a. Google b. Internet Explorer
   c. Linux d. Yahoo

Ans. c

2. ..... is a sequence of instructions to be executed by the computer.
   a. Program b. Language
   c. Command d. Flowchart

Ans. a

3. ..... is a type of language processor that translates program line-by-line.
   a. Interpreter b. Compiler
   c. Syntax d. Assembler

Ans. a

4. Which among the following acts as an interface between a user and computer hardware?
   a. Interpreter b. OS
   c. Syntax d. Language

Ans. b

5. ..... is a utility program that tries to minimize the fragmentation on the disk.
   a. Backup utility
   b. Disk defragmentation
   c. Compression utility
   d. None of them

Ans. b

Very Short Answer Questions

6. How many types of computer software are generally available?

Ans. Two types of computer software – system software and application software

7. What is the difference between hardware and software?

Ans. Hardware denotes the physical components of a computer; whereas, software denotes the logical components of a computer.

8. What do you mean by language processor?

Ans. A language processor is a software that translates the language of any program into a format that a computer can understand, interpret and execute.

9. What is the difference between a compiler and an interpreter?

Ans. A compiler is a language processor that performs the conversion of the whole program in one go and displays all the errors in the program with their respective line numbers. On the contrary, when the interpreter encounters an error in a line, it reports the error at that very instance. Interpreter performs the translation of high-level language program line-by-line.

10. What are the major components of the computer ecosystem?

Ans. The major components of the computer ecosystem are as follows:
- Hardware
- Memory
- Operating System
- User

11. Name any one of the specific purpose software used for financial accounting.

Ans. Tally is a specific purpose software used in financial accounting.

12. Fill in the following blanks:
   a. ..... is software that is used to design pamphlets, brochures, and visiting cards.
   b. As soon as you start your computer, ... is the first software that runs on your computer.

Ans.
   a. DTP
   b. Operating System

13. Which among the following is true?
   a. OS is hardware that helps the other parts of the computer system to run smoothly.
   b. OS is software that helps to manage the computer system.

Ans. b. OS is software that helps to manage the computer system.

14. Which programming language uses the least number of lines to write a program?

Ans. Fourth generation languages (4GL) uses the least number of lines to write a program.

15. Which software is built in-house for a special purpose?

Ans. Customized software is built in-house for a special purpose.

16. Which system software handles conversion between the different generations of languages?

Ans. Language processor handles conversion between the different generations of languages.

Short Answer Questions

17. Name any three high-level languages.

Ans. The following are some common high-level languages:

- **BASIC**: A 3GL that consists of simple sets of instructions and is easy to learn for a new programmer.
- **FORTRAN**: A 3GL that is specially designed to solve scientific and mathematical problems.
- **C++**: An object-oriented language evolved from a procedural language called C.

18. What is system software? Discuss with the help of an example.

Ans. System software is a set of programs defined to handle the internal computer operations. The system software contains all the programs, languages, and documentations that are supplied by the manufacturer of the computer. Some common examples of system software are OS (such as Fedora Linux, Windows XP, and Mac OS) and device drivers (such as sound card driver, and display driver).

19. List the categories of system software.

Ans. The categories of system software are as follows:

- Operating System
- Language Processor
- Device Drivers
- Utility Software

20. Why are utility software called so?

Ans. A utility software is also referred as service program, service routine, service tool, or utility routine. Utility software are named so as they help in performing utilities that help a computer to perform various functions, such as analyzing and configuring data, optimizing and maintaining resources.

21. Define the following:

a. Backup utility
b. Compression utility
c. Disk defragmenter
d. Antivirus software

Ans.

a. **Backup utility**: The backup utility software helps to secure data.
b. **Compression utility**: The compression utility facilitates compression of files.
c. **Disk defragmenter**: Disk defragmentation is a utility program that tries to minimize the fragmentation on the disk.
d. **Antivirus software**: Antivirus software protects the computer from unexpected virus attacks.

22. Name any five application software and explain their usage.

Ans. The following are the names of five application software:

- **Word Processing Program**: A word processor enables the users to enter, edit, format, and print text.
- **Desktop Publishing Software**: It allows users to create documents, such as brochures and magazines.
- **Browser**: A browser is a type of application software that is used to explore, retrieve, and present the information available on the World Wide Web (WWW).
- **Personal Information Manager (PIM)**: Personal Information Manager (PIM) helps the user to organize information. PIMs, such as Outlook, also include calendar, scheduling and calculator programs.
- **Database Program**: The database program allows the user to store, sort, and retrieve a large amount of data.

23. Name any four programming languages and also mention the generation in which they have evolved.

Ans. The following are the names of programming languages:

- **COBOL**: Third generation language
- **Assembly language**: Second generation language
- **Ramis**: Fourth generation language
- **BASIC**: Third generation language

24. What do you mean by fragmentation?

Ans. Fragmentation occurs when files on a disk are deleted and new files are added. It slows the disk access and degrades the overall performance of disk operations. The OS fragments a file when it becomes too large to be stored at a single location on the disk. The OS splits the file in pieces and stores these pieces at different locations on the disk. As a result, the fragmented file takes considerably longer time to be accessed.

25. List some examples of popular antivirus software.

Ans. Some examples of popular antivirus software are as follows:

- Norton
- McAfee
- SmartCOP
- Quick Heal
- Kaspersky
- Avast

26. List the different categories of application software.

Ans. The different categories of application software are as follows:

- **General Purpose Software**: General purpose software is a category of application software that is designed for individual users to meet their day-to-day requirements.
- **Specific Purpose Software**: Specific purpose software is a category of application software that is created to execute only a specific task.
- **Customized Software**: Customized software refers to software developed by an in-house development group, a software firm, or an independent software developer for a particular group or organization.

27. What is the importance of a database program?

Ans. Database Management System (DBMS) or database program refers to software that provides important tools to create and manipulate data in a database. Further, it provides tools to list down the subsets of data that meet defined criteria. The database program allows the user to store, sort, and retrieve a large amount of data. It also allows the user to add new information, search information through previously stored data, and print records.

Long Answer Questions

28. Compare machine language, assembly language, and high-level language.

Ans. The comparison between machine language, assembly language and high-level language are as follows:

- **Machine language:** 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.
- **Assembly language:** 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 mnemonics and requires an assembler for binary conversion of instructions. Every CPU has its own machine language and assembly language, so an assembly language program written for one type of CPU won't run on another CPU. So the instructions need to be converted into its binary form.
- **High-level language:** High-level languages are also known as third generation programming languages (3GLs). These languages 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. These languages do not directly interact with the computer as they are independent of the internal machine code.

29. What is the use of a disk defragmenter?

Ans. Disk defragmenter is a utility program that tries to minimize the fragmentation on the disk. The OS fragments a file when it becomes too large to be stored at a single location on the disk. The OS splits the file in pieces and stores these pieces at different locations on the disk. As a result, the fragmented file takes considerably longer time to be accessed. The disk defragmenter locates the fragmented files on local volumes and rearranges these files to free space on the disk. The disk defragmentation process helps store files in cohesive units and free space in one cohesive block.

30. Compilers are good for long programs, whereas interpreters are good for short programs. Explain.

Ans. A compiler translates a program in one go, whereas an interpreter translates a program line by line. A compiler will list all the errors in the last, i.e. after going through the program completely. When the program is error-free, it will generate the object code. However, an interpreter checks for error, each instruction or command, and terminates the program as soon as it encounters an error. On finding an error the interpreter also prints the error messages immediately. Compilers are good for long programs, whereas interpreters are good for small and short programs. Compiler translates the program into object program and the execution is done in the last, but an interpreter translates and executes the program at the same time, i.e. line-by-line.

31. Explain the functioning of an operating system with the help of a real-life example.

Ans. The software that controls and manages the hardware is known as Operating system (OS). In other words, we can say that an OS enables a user to conveniently handle the computer and make the best use of its hardware. A user simply gives a command to an OS, that is, the user specifies what should be done, and the OS decides itself how and when the tasks should be done. Suppose, a customer visits a restaurant and place an order for the dinner. In this situation, the following activities are likely to take place:

- Customer's order will be taken by the waiter.
- Customer's order will be processed by the cook.
- Customer's order will be served by the waiter.
- The bill will be generated by the cashier.

However, all these activities will be controlled, managed, and executed by the manager of the restaurant.

He is responsible for the following:

- How the order will be taken by the waiter?
- How the order will be processed by the cook?
- How the order will be served by the waiter?
- How the bill will be generated?

Figure 1 shows the functioning of an operating system with the help of this example:

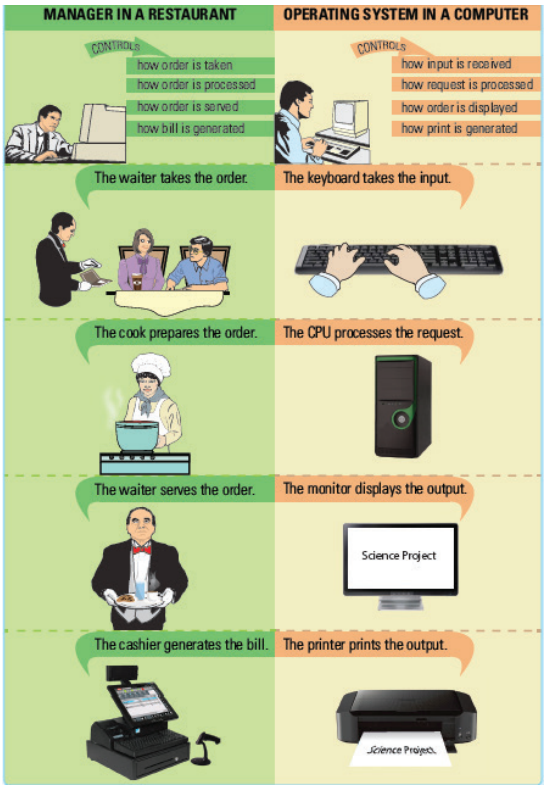

Figure 1: Functioning of an Operating System

32. What is utility software? List the different types of utility software with examples.

Ans. Utility software (or utility) is a service program, service routine, service tool, or utility routine.

Utilities are defined as those helpful software that help a computer to perform various functions, such as analyzing and configuring data, optimizing and maintaining resources.

The following are different types of utility software:

- **Text Editor:** gedit
- **Backup Utility:** AMANDA
- **Compression:** WinZip
- **Disk Defragmenter:** XFS
- **Anti-virus Software:** Norton

33. What safety measures should you follow to avoid virus attacks?

Ans. The following are the safety measures which should be followed to avoid virus attacks:

- Never download files from unfamiliar or doubtful websites.
- Do not open any suspicious or unfamiliar e-mail. Simply delete it.
- Maintain a separate folder for downloading files from the Internet. Once the download is complete, scan the folder with antivirus software. Once the scan is complete, move the file to some other location on the computer.
- Update the antivirus software regularly from the Internet to empower it against new viruses.
- Remove files having extension .TMP and .CHK regularly.

34. 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.

The disadvantages of using customized software are as follows:

- 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 software.
- Customized software cannot be directly installed everywhere because of the lack of necessary infrastructure and resources required for its installation.

35. What are the differences between low-level and high-level languages?

Ans. The difference between low-level and high-level languages are as follows:

- **Low-level languages (or LLLs):** These are programming languages that are directly understandable by a computer. These languages are often described as being "close to the hardware". Some examples of low-level language are assembly language and machine language.
- **High-level languages (or HLLs):** These are the programming languages that are more or less independent of a particular type of computer. As an HLL program is written in a human-readable format, these languages are described as being "close to the human language". Some examples of high-level languages are C, FORTRAN, Pascal, and Java.

36. Explain the third generation languages. What are some common 3GLs?

Ans. 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. Some of the advantages of using high-level languages are: they are easy to use, programs can be debugged and modified easily, these languages are not computer-specific like machine languages.

The following are some third generation languages:

- **BASIC:** A 3GL that consists of simple sets of instructions and is easy to learn for a new programmer.
- **FORTRAN:** A 3GL that is specially designed to solve scientific and mathematical problems.
- **C++:** An object-oriented language evolved from a procedural language called C.
- **Java:** An object-oriented language that is platform-independent, which means it can run on any platform, such as Windows, Linux, and Mac.

37. What do you mean by mnemonics?

Ans. In general, a mnemonic is similar to an abbreviation which helps in remembering something. In an assembly language, a mnemonic is used as an abbreviation in the form of symbolic names for a single executable machine language instruction (known as an opcode). It is entered in the operation code field of each assembler program instruction. Mnemonics are the words like ADD (for addition), SUB (for subtraction), and EQU (for equals to), etc. used as short codes in the assembly language. They are used to represent various arithmetic and logical operations. For example, an instruction which means 'store the contents of the accumulator' may be represented with the mnemonic STA.

Formative Assessment

Application-Oriented Questions

1. Suppose your teacher has given an assignment to prepare a presentation on the topic Computer Software. Which of the following application software will you use to prepare this presentation?

a. OpenOffice Writer b. OpenOffice Calc
c. OpenOffice Impress d. OpenOffice Base

Ans. We will use OpenOffice Impress to prepare the presentation.

2. Which software will you use to do the following tasks?

a. Minimize the fragmentation on the disk
b. Compress files
c. Create a backup of files
d. Edit, format, and print text
e. Create and manage bulk of data

Ans.
a. Disk Defragmenter
b. Compression software
c. Backup software
d. Word processor
e. DBMS