CHAPTER 7   Windows Operating System

Overview

An **operating system** is system software that provides an interface for the user to interact with the computer. Without a computer Operating System a computer would be useless. The purpose of an operating system is to organize and control hardware and software so that the devices it manages behave in a flexible but predictable way.

7.1   Types of Operating System

Operating systems are classified on the basis of various features such as user interaction, how many tasks they can perform at a time, and how many processors they can support etc. On the basis of user interaction there are two types of operating system

- GUI (Graphical User Interface) Operating system
- Command Line Operating System

7.1.1   Graphical User Interface Operating System

A GUI operating system provides a graphical user interface to establish the user communication with the computer. The user does not require memorizing commands to perform various tasks such as copying a file, opening a document, printing a spreadsheet etc. The user uses graphical objects (e.g. icon, windows, buttons etc) to perform different tasks. He/She just requires recognizing various graphical objects and tasks that can be performed with them. Examples of GUI operating system are Windows, Linux, and Solaris etc.

7.1.2   Command Line Operating System

A command line operating system provides a command prompt to the user for typing different commands to interact with the computer. The user needs to memorize commands to perform deferent tasks. Examples of Command line operating system are DOS (Disk Operating System), Unix etc.
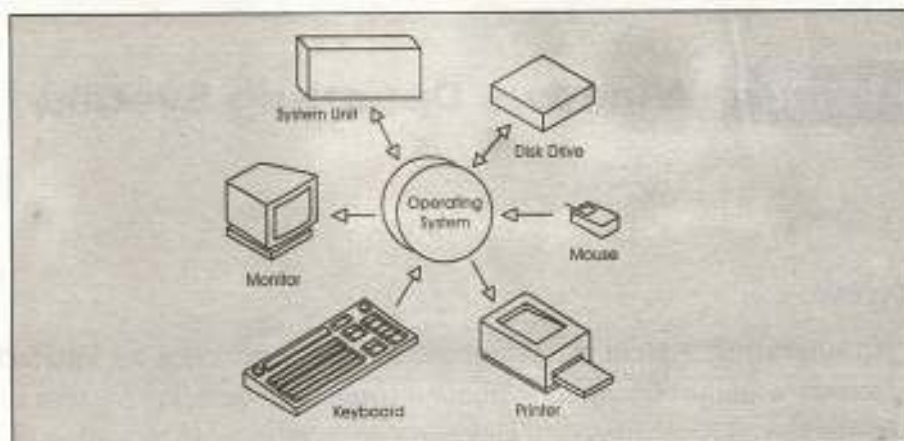
Figure 7.1: Operating System

7.1.3 Command Line Interface Operating System Vs Graphical User Interface Operating System

Feature	Command Line O.S.	GUI O.S.
Ease	Because of the memorization and familiarity needed to operate a command line interface new users find it much more difficult to successfully navigate and operate a command line interface.	Although new users may have a difficult at time learning to use the mouse to operate and use a GUI most users pick up this interface much easier when compared to a command line interface.
Control	Users have much more control of their file system and operating system in a command line interface. For example users can easily copy a specific type of file from one location to another with a one-line command.	Although a GUI offers plenty of control of a file system and operating system, often advance users or users who need to do specific task may need to resort to a command line to complete that task
Multitasking	Although many command line environments are capable of multitasking they do not offer the same ease and ability to view multiple things at once on one screen.	GUI users have windows that enable a user to easily view, control, and manipulate multiple tasks at once and are commonly much faster.
Speed	Because command line users only need to use their keyboards to navigate a	A GUI may be easier to use because of the mouse. However using a mouse

		command line interface and often only need to execute a few lines to perform a task. An advanced command line interface user would be able to get something done faster.	and/or keyboard to navigate and control your operating system for many tasks is going to be much slower in this case.
	Scripting	A command line interface enables a user to easily script a sequence of commands to perform a task or execute a program.	Although a GUI enables a user to create shortcuts, tasks, or other similar actions to complete a task or run a program it doesn't even come close in comparison to what is available through a command line.

7.1.4 Purpose of Operating System

At the simplest level, there are two basic purpose of an operating system:

- It manages the hardware and software resources of the system. These resources include the processor, memory, disk space, etc.

- It provides a stable, consistent way for applications to deal with the hardware without having to know all the details of the hardware.

7.2 Starting to Use Windows Operating System

Windows is a GUI operating system developed by Microsoft Corporation. It is widely used in businesses, educational institutes, and research organizations. The first successful series of Windows was Windows 3.x series. Windows 3.x was not an operating system; it was rather an operating environment providing a GUI that runs on top of DOS, replacing the command line interface with a point-and-click system.

In 1995, Microsoft released **Windows 95,** a complete operating system for Personal computers. Windows 98 was an improved version of Windows 95 from Microsoft, released in 1998. Meanwhile Microsoft concentrated on incorporating networking features in Windows. So the company released Windows NT (New Technology) with extensive networking features. Since then, all recent versions of Windows i.e. Windows 2000 (server and professional), and Windows XP are based on NT Technology.

7.2.1 Objects of Windows Operating System

Windows consists of number of graphical objects, which act as interface between user and the computer. It controls the overall working of the computer system, manages system resources, and provides a multitasking environment for the user to perform more than one task simultaneously.

The following are the basic components of Windows Operating System:

- **Desktop:** The on-screen work area on which windows, icons, menus, and dialog boxes appear is called desktop. The desktop is actually the entering point in Windows. The first object that you see on starting windows is the desktop (screen). It contains icons (images) for working with different applications that you need to interact with on regular basis.

- **My Computer:** On windows Desktop, you will see and icon captioned **My computer.** While installing windows, you divide the hard disk into multiple partitions; each one is referred to as a drive. When you double click the My Computer icon, it shows you all drives on your system including a floppy drive, and CD drive. These drives are represented as icons in a window.

- **Recycle Bin:** You may create new folders and files on any drive. It may be required to delete them. When you delete a file or folder, it does not remove from the hard disk permanently. Rather Windows maintain a storage area on the hard disk for storing the deleted items. This storage space is named as Recycle Bin. The deleted items are moved to Recycle Bin. You can permanently delete or restore them from Recycle Bin.

- **My Documents:** It a folder created by windows on installation time. It is the default folder for storing different kinds of documents. If you create a document in Microsoft Word or MS Excel and don't specify the location where it should be saved, then by default windows will save it in my documents folder.

- **Windows Explorer:** Windows Explorer acts as a directory browser and File Manager for Windows. It is an efficient way for locating and managing files on your computer. Using Explorer you can easily browse through all the drives and network resources available.

- **Internet Explorer:** Internet Explorer is web browser that is launched with Microsoft Windows Operating system. It is used to surf Internet. It is powerful web browser providing advance features to work on WWW.

- **The Window:** The most important feature of windows operating system is a window. This is the basic building block of all graphical objects in Microsoft Windows. Windows view most of the graphical objects as a window such as button, menu, and toolbar etc. are treated as a separate window. Different applications starts in different window objects e.g. Internet explorer, windows explorer, MS Word, and MS Excel etc.

- **Control Panel:** Control Panel is the place where you can perform system management tasks such as installing/uninstalling new hardware devices, managing system resources through **Administrative tools**, sharing printers, and setting up date and time etc.

- **Start Button:** Start button is the gateway of accessing most of the programs installed on the computer. You can start any program by just making a mouse click, can open or find documents, can change windows settings, can get Help, can manage Files, can maintain system, and can do much more.

7.2.2　Working with Mouse and Keyboard

Mouse and keyboard are the basic input devices used with personal computers. Almost every operating system running on PCs provide interaction through these devices. Microsoft Windows captures different actions performed by the mouse and the keyboard. These actions are referred to as *events.* Here we discuss some important mouse and keyboard events:

Mouse Events: *Mouse events* are the action that can be performed by using the mouse. Following are the most common events triggered with a mouse:

- Left Click　　　• Right Click　　　• Drag etc.

Left Click: This event triggers when your press the left mouse button. Windows captures this event and performs certain tasks. Normally this event is used to select a graphical object such as a file icon or text in a document, or to press a button such as the start button and closing, opening or minimizing a window etc.

Right Click: This event triggers when you press the right mouse button. Most of the time, this event is used to view the properties of an object such as file, folder, desktop etc.

Drag: This event triggers when you press the left mouse button and move the mouse while keeping the left mouse button pressed. This event is used to select more than one items at a time, or to drop an object into another application.

Keyboard Events: *Keyboard events* are the action that can be performed by using the keyboard. Different applications / programs perform different actions against these events Following are the most common events triggered with a mouse:

- Key Up   • Key Down etc.

Key Up: This event triggers when you release an already pressed key of the keyboard

Key Down: This event triggers when you press any of the keyboard's key.

7.2.3 Features of Windows

Microsoft Windows is a complete operating system. Their initial versions were lacking network support but almost all of the latest versions are providing networking features. We shall consider Windows 2000 while discussing features of Windows operating system.

- **Multitasking:** The capability of an operating system to load multiple programs into memory at one time and to perform two or more processes concurrently, such as printing a document while editing another is known as **multitasking**.

    Windows 2000 is a multitasking operating system. It let you execute multiple tasks at a time. And it responds to all tasks so quickly that it seems to be paying full attention to every task.

- **Multiprocessing:** Windows 2000 provide multiprocessing capability. It is capable of supporting and utilizing two or more microprocessors in a computer. A big task is divided into a number of small independent components, and each processor is assigned a different component. The processors work on different component in parallel. As a result the assigned task is completed in considerably short interval of time as compared to a single processing environment.

- **Multi-User Operating System:** Windows 2000 is a multi-user operating system. A multi-user Operating System allows for multiple users to use the same computer at the same time and/or different times.

- **Plug and Play:** Plug and Play refers to a set of specifications that allow a computer to automatically detect and configure a device, and install the appropriate device drivers.

    Windows 2000 is equipped with this feature. It has a mechanism defined that automatically detects a new hardware device. There are number of device drivers launched with Windows 2000, so you don't need

to install drivers for many devices, windows itself choose an appropriate one for you. However, sometimes you may need to install a driver for some devices if it is not available.

* **Networking:** Windows 2000 is equipped with full networking support. It provides features for establishing, maintaining and troubleshooting a network.

7.3   Disk Management

Windows has strong disk and file management capabilities. Before going into detail of Windows disk and file management features, it is important to understand some basic concepts about them.

Prior to Windows installation on a computer, the disk is divided into multiple partitions. A **partition** is a portion of physical disk that functions as though it were a physically separate disk.

Windows usually create two basic types of partitions, these are:

* Primary Partition   * Extended Partition

Primary Partition: A primary partition is one that can be used as the system partition. Windows 2000 and other operating systems can start from a primary partition. You can create up to four primary partitions on a basic disk, or three primary partitions and an extended partition. Primary partitions can be created only on basic disks and cannot be sub partitioned.

Extended Partitioned: Extended partition refers to a portion of a disk that can contain other partitions. Only one of the four partitions allowed per physical disk can be an extended partition, and no primary partition needs to be present to create an extended partition.

7.3.1 Disk Management Utility

The Disk Management utility gives you a graphical interface for viewing and performing maintenance on all of the hard drives and CD drives in your computer/server. You can see immediately whether your drives (both physical and logical) are healthy or not (figure 7.2).
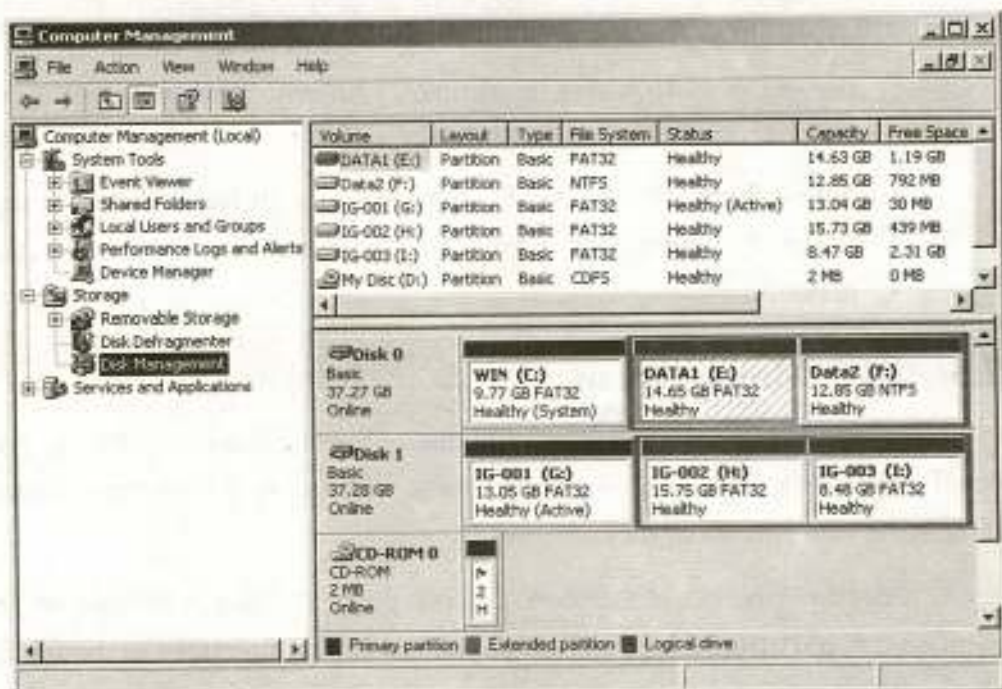
Figure 7.2: Disk Management Utility

As you can see, you can find the size of the drive, its size and file system and status at a glance. Disk management also indicates which drive contains the system partition. There are several different messages you can receive as to the status of the disks, and those are at times dependant on what type of disk it is.

7.4 File Management

Files are recognized by their extensions in Microsoft Windows. When you attempt to open a file, Windows checks the file extension against a database of registered file types (windows registry) to determine what action it should take. A registered file type can have multiple actions e.g. open and print etc. If windows does not recognize the file type, it offers a dialog box and lets you choose the appropriate applicatin to view the file (figure 7.3).
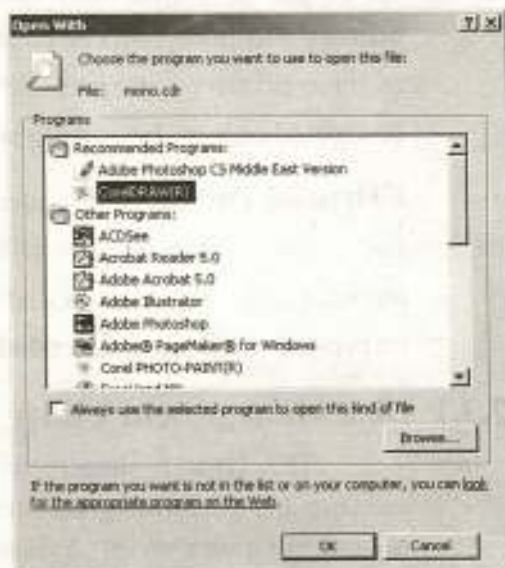

Figure 7.3: Opening document in appropriate application

7.4.1 Windows Explorer

Windows Explorer acts as a file manager in Windows Operating System. You can manage files and folders on your computer through Windows Explorer. Files and folders are the basic file management units in Window.

Windows explorer offers many actions that can be performed on files and folders. You can cut, copy, paste, rename or delete a file or folder from windows explorer. It shows files and folders in a hierarchical way. It contains two panes; left pane displays folders, and drives on your computer in a tree view shape whereas the right pane shows the detailed view of folder or drive selected in the left pane.

With windows explorer, not only you can manage the local files, folders and drives but also the remote files and folders.
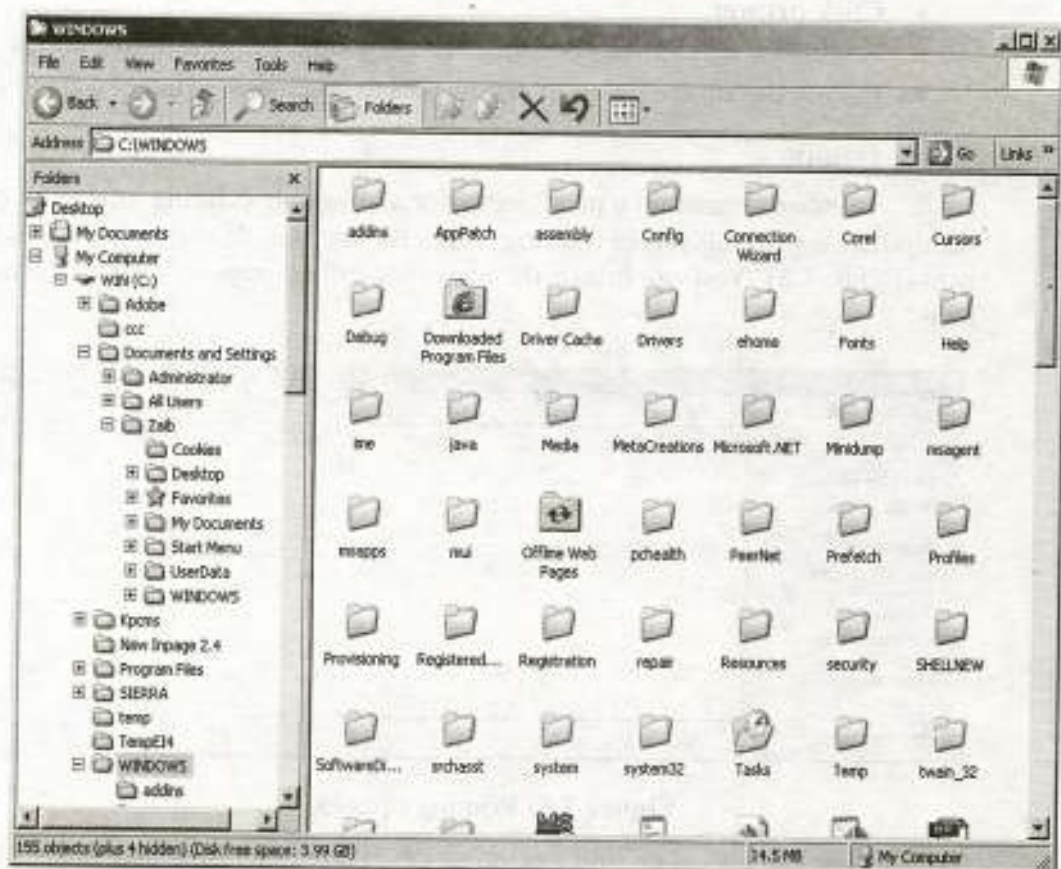

Figure 7.4: Windows Explorer

7.5   Control Printing Jobs

Windows have powerful features to control printing jobs. Windows maintains a print queue for the jobs (documents) to be printed. You can share a printer on a network as well, so that the whole network can take advantage of the printer resource.

You can add multiple printers to your computer. But at a time only one of them will be assigned a default status. All jobs are directed to default printer by default. If you want to direct a particular job to another printer, you may specify at the time of printing. The default printer can be changed at any time by just selecting printers from the setting submenu of the **start** menu, and then setting on the option "set as default printer".

7.5.1 Adding a new printer

You can add a new printer to your computer by following these steps:

- Click **Start** button
- Follow the **settings** submenu
- Click **printer**
- A window will appear, double click the icon captioned **Add Printer**
- Follow the steps offered by the wizard to add a new printer

7.5.2 Print Queue

Windows maintain a print queue for all ongoing printing jobs. You can manipulate a printing job in multiple ways by just double clicking the printer icon (figure 7.5). You can follow the above-described steps to view the printer icon.
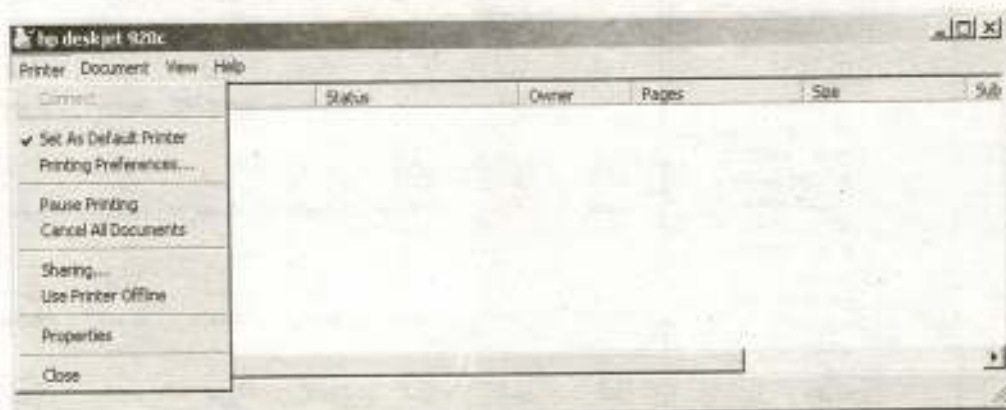

Figure 7.5: Printing options

You can cancel or stop a printing job at any time. Similarly many other printing options can be set such as changing the printing layout (landscape or portrait), and printing preferences e.g. effects and finishing etc.

Exercise 7C

1. Fill in the blanks:

   (i) GUI stands for _____

   (ii) The capability of an operating system to load multiple programs into memory at one time is called _____

   (iii) With plug and play a computer can automatically _____ and _____ a device.

   (iv) Multiple actions can be performed on a _____ file type _____ partition refers to a portion of a disk that can contain other partitions

   (v) A _____ operating system allows multiple users to perform multiple tasks at the same time.

   (vi) Windows explorer offers many actions that can be performed on _____ and _____

   (vii) Windows maintain a _____ for all printing jobs.

   (viii) All deleted items are stored in _____

   (ix) The Disk Management utility gives you a _____ interface

2. Choose the correct option:

   (i) An operating system is a
      (a) System Utility   (b) Application Software
      (c) System software   (d) Software package

   (ii) Ctrl + Alt + Del is
      (a) An invalid key combination   (b) Recognized by windows only
      (c) Used to close the active window   (d) Both b and c

   (iii) As compared to command line operating system, a GUI operating system is
      (a) More efficient (b) Easier to use (c) More reliable (d) All of the above

   (iv) The maximum number of primary partitions that can be created on a disk is
      (a) Two   (b) Three   (c) Four   (d) None of the above

   (v) Windows explorer is used to
      (a) Access the Internet   (b) Explore system resources
      (c) Perform maintenance on the hard disk
      (d) Navigate files and folders on the computer

Exercise 7C

1. Fill in the blanks:
    (i)   GUI stands for _____
    (ii) The capability of an operating system to load multiple programs into memory at one time is called _____
    (iii) With plug and play a computer can automatically _____ and _____ a device.
    (iv) Multiple actions can be performed on a _____ file type _____ partition refers to a portion of a disk that can contain other partitions
    (v)   A _____ operating system allows multiple users to perform multiple tasks at the same time.
    (vi) Windows explorer offers many actions that can be performed on _____ and _____
    (vii) Windows maintain a _____ for all printing jobs.
    (viii) All deleted items are stored in _____
    (ix) The Disk Management utility gives you a _____ interface

2. Choose the correct option:
    (i)   An operating system is a
          (a) System Utility   (b) Application Software
          (c) System software   (d) Software package
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          (a) An invalid key combination (b) Recognized by windows only
          (c) Used to close the active window (d) Both b and c
    (iii) As compared to command line operating system, a GUI operating system is
          (a) More efficient (b) Easier to use (c) More reliable (d) All of the above
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          (a) Two   (b) Three   (c) Four   (d) None of the above
    (v)   Windows explorer is used to
          (a) Access the Internet   (b) Explore system resources
          (c) Perform maintenance on the hard disk
          (d) Navigate files and folders on the computer

3.   Write T for true and F for false statement:
  (i)   Primary partitions can not be created on basic disks.
  (ii)   Microsoft Windows is a single user operating system.
  (iii)   In windows explorer, left pane displays folders and drives on your computer in a tree view shape.
  (iv)   With Windows explorer, you can only manage the local files, folders and drives.
  (v)   GUI was first introduced by Apple's Macintosh computers.
  (vi)   Operating system is responsible for the effective use of computer system.
  (vii)   Maximum four primary partitions can be created on a basic disk.
  (viii)   Windows checks the file extension against a database of registered file types.
  (ix)   Disk management also indicates which drive contains the system partition.
  (x)   Prior to Windows installation on a computer, the disk is partitioned.

4.   Define operating system and discuss their types.

5.   Give a comparison between Command Line operating system and Graphical User Interface.

6.   Discuss different features of Windows 2000 operating system.

7.   Write a short note on each of the following:
  • Disk Management Utility   • Windows Explorer   • Print Queue

8.   What do you mean by *Plug and Play*? Does Windows 2000 provide this feature?

9.   Define Partitioning. Briefly describe primary and extended partitioning.

10.   Differentiate the following:
  • Multitasking and Multiprocessing • File Management and Disk Management
  • Single-User operating system and Multi-User operating system

Answers

1.   (i) Graphical User Interface   (ii) Multitasking   (iii) Detect, Configure   (iv) Registered
   (v) Extended   (vi) Multi-User   (vii) Files, Folders   (viii) Print queue
   (ix) Recycle bin   (x) Graphical

2.   (i) c   (ii) b   (iii) b   (iv) c   (v) d

3.   (i) F   (ii) F   (iii) T   (iv) F   (v) T
   (vi) T   (vii) T   (viii) T   (ix) T   (x) T