

CHAPTER 07

OPERATING SYSTEM

An Operating System (OS) is a program which acts as an interface between the user and the computer hardware. The interface enables a user to utilise hardware resources very efficiently.

Operating system is an organised collection or integrated set of specialised programs that controls the overall operations of a computer. It is a program that must be on any computer for proper booting.

Functions of Operating System

Process Management A process is the basic unit of execution in the operating system. It is a process by which operating system can control the planning, monitoring and performance of a CPU.

Memory Management It is a process of controlling and coordinating computer memory. It ensures that all processes are able to access their memory or not.

File Management It is the main function of operating system. It manages all data files in a computer system. At the time of execution of a program, the operating system also performs the task of copying files from secondary memory to primary memory.

Device Management It is a process of managing the operation and maintenance of input/output devices. It also facilitates the interface between all the connected devices.

Types of Operating System

1. Batch Processing Operating System

In this operating system, a number of jobs are put together and executed as a group. This operating system is responsible for scheduling the jobs according to priority and the resource required. e.g. Unix.

2. Single User Operating System

It is a type of operating system which allows only one user at a time. Operating system for Personal Computer (PC) is a single user OS. They are designed to manage one task at a time.
e.g. MS-DOS, Windows 9X.

3. Multi User Operating System

This OS allows multiple users to access a computer system concurrently. It is used in computer networks that allow same data and applications to be accessed by multiple users at the same time. e.g. VMS.

4. Multi-Tasking Operating System

In this operating system, more than one process can be executed concurrently. It also allows the user to switch between the running applications. e.g. Linux, Unix, Windows 95.

Multi-tasking OS further classified into two types

- (i) **Preemptive Multitasking OS** It is a type of multitasking OS that allows computer programs to share operating system and underlying hardware resources.
- (ii) **Cooperative Multitasking OS** It is the simplest form of multitasking. In it, each program can control the CPU for as long as it need it.

5. Time Sharing Operating System

This operating system allows multiple programs to simultaneously share the computer resources. It provides to each process to be run on. e.g. Mac OS.

6. Real Time Operating System (RTOS)

These operating systems are designed to respond to an event within a pre-determined time.

They are often used in applications such as flight reservation system, military applications, etc. This type of operating system increases the availability and reliability of the system. e.g. Linux.

There are two types of real time operating system

- (i) **Hard Real Time OS** In this RTOS, all the tasks are required to be completed within the specified time limit.
- (ii) **Soft Real Time OS** In this RTOS, all the tasks are not required to be completed within the specified time limit.

User Interface

The system which provides the facility to the user to interact with the computer is called user interface. It allows users to easily access and

communicate with the applications and the hardware.

The user can interact with the computer by using mainly two kinds of interface

1. Graphical User Interface (GUI)

It is a computer program that enables a person to communicate with a computer through the use of symbols, visual metaphors and pointing devices. It is best known for its implementation in Apple products.

The first graphical user interface was designed by Xerox Corporation in 1970s. GUIs can be found in handheld devices such as MP3 players, portable media players, gaming devices, etc.

2. Character User Interface (CUI)

It is also known as Command Line Interface (CLI). CUI is a mechanism of interacting with a computer system or software by typing commands to perform specific tasks.

CUI only uses text types one after another just as commands used in MS-DOS.

Booting

Booting is starting up a computer or computer appliance until it can be used. It can be initiated by hardware such as a Start button or by Software command.

There are two types of booting

- **Cold Booting** When a computer is turned ON after it has been completely shutdown.
- **Warm Booting** When a computer is restarted by pressing the combination of Ctrl + Alt + Del keys or by Restart button.

Some Important Operating Systems

Some popular operating systems are as follows

1. **UNIX** The first version of Unix was developed in 1969 by Ken Thompson and Dennis Ritchie. It is primarily used to a server rather than a work station and should not be used by anyone who does not understand the system.

2. **Apple Macintosh (Mac OS)** It was introduced in January, 1984 by Steve Jobs and was initially named as system software, which was later renamed as Mac OS.

Versions of Mac OSX are Yosemite, Mavericks, Mountain Lion, Tiger, Tiger Panther, Jaguar, etc.

3. **LINUX** The first Linux Kernel was released in September, 1991 by Linus Torvalds. It is an open source software.

Linux is similar to Unix in operations. It is difficult to understand by anyone.

Kernel is the core of the operating system that supports the process by providing a path to the peripheral devices.

4. **Microsoft Windows** It is an operating system, based on GUI, developed by Microsoft. Microsoft first introduced an operating environment named Windows in November 1985.

MS-DOS (Microsoft-Disk Operating System)

The DOS OS was developed by Microsoft in 1980 for micro computers. MS-DOS was the first operating system that run on PC developed by IBM Corporation in 1981.

DOS is a single user operating system. It is the only operating system which can be loaded in the main memory of the computer using a single disk.

Structure of DOS

There are four essential programs associated with the control of computer and the way it interacts with them

1. **Boot Record** It includes loading the operating system into main memory. It is the main program of MS-DOS.
2. **Basic Input/Output System (BIOS. sys)** It provides an interface between the hardware and programs.

3. **The MS-DOS. sys Program** It is a collection of program routines and data tables that provide high level programs such as application programs.

4. **The Command.com Program** It provides a standard set of commands that gives users access to file management, configuration and miscellaneous functions.

Configuration of DOS

Config. sys, Autoexec. bat and their files provide the environment to computer to set commands

- (i) **Config. sys** It adjusts the system according to commands.
- (ii) **Autoexec.bat** When the system is powered ON, this file executes in automatically command line.

Important Extensions and their Meanings

| Extensions | Meanings |
|------------|------------------|
| .exe | Executable files |
| .com | Command files |
| .bat | Batch files |
| .doc | Document files |
| .txt | Text files |
| .prg | Program files |
| .ovr | Over lays |
| .sys | System files |

Types of MS-DOS Commands

There are two types of MS-DOS commands as follows

1. **Internal Commands** These commands are automatically loaded into main memory when the booting process gets completed.
e.g. DATE, TIME, VER, VOL, DIR, COPY, CLS, etc.
2. **External Commands** These commands require external files to be loaded in the computer to run.
e.g. Checking disk, comparing disk, formatting, etc.

Important Commands and their Uses

| Commands | Uses |
|----------|---|
| CALL | Call one batch program from another |
| CD | Change Directory-move to a specific folder |
| CLS | Clear the screen |
| COPY | Copy one or more files to another location |
| DATE | Display or set the date |
| DEL | Delete one or more files |
| DIR | Display a list of files and folders |
| ERASE | Delete one or more files |
| EDIT | View and edit files |
| EXIT | Quit the current script/routine and set an error level |
| FORMAT | To erase and prepare the disk drive |
| IF | Conditionally perform a command |
| MD | Create new folders |
| MOVE | Move files from one folder to another |
| PATH | Display or set a search path for executable files |
| PRINT | Prints data to a printer port |
| REN | Rename a file or directory |
| RD | Remove an empty directory |
| SORT | Sort input and displays the output to the screen |
| START | Start a program, command or batch file |
| TIME | Display or set the system time |
| TYPE | Display the content of a text file |
| VER | Display version information |
| XCOPY | Copy multiple files, directories or drives from one location to another |

Mobile Operating System

This OS operates on Smartphones, Tablets and Digital Mobile devices. It controls mobile devices and its design supports wireless communication and

different types of mobile applications. It has built-in support for mobile multimedia formats.

Some popular mobile operating systems are as follows

1. **Android** It is a mobile OS developed by Google, which is based on Linux (main part of operating system). It is basically designed for touch screen mobile devices like Tablets, Smartphones, etc. Now-a-days, it is most widely used in mobile phones. The latest version of Android is Android 11, which was released on 8th September, 2020.
2. **Symbian** It is the OS developed and sold by Symbian Ltd. It is an open source mobile OS designed for Smartphones.
It has been used by many major handset manufacturers including Motorola, Nokia, Samsung, Sony, etc. The latest version of Symbian is Nokia Belle, which was released on 2 October, 2012.
3. **iOS** It is the popular mobile operating system developed by Apple Incorporation. This operating system is commonly used in Apple iPhone, iPod Touch, iPad, etc. The latest version of iOS is iOS 14.3, which was released on 14 December, 2020.
4. **Black Berry** It is the most secure operating system used in leading Smartphones developed by Black Berry company. It also supports WAP 1.2. The latest version of BlackBerry is Black Berry OS 7.1.0, which was released in 2013.
5. **Windows Phone** It is a mobile operating system developed by Microsoft in 2010, for smartphones. It is a commercial proprietary software. Its latest version is 8.1, which was released on 2 June, 2015.

QUESTION BANK

1. Which of the following is the type of software that controls the internal operations in the computer?
 - (1) Shareware
 - (2) Public domain software
 - (3) Application software
 - (4) Operating system software
2. controls the way in which the computer system does function and provides a means by which users can interact with the computer.
 - (1) Operating system
 - (2) Motherboard
 - (3) Platform
 - (4) Application software
3. A collection of programs that controls how your computer system runs and processes information is called [IBPS Clerk 2014]
 - (1) operating system (2) computer
 - (3) office (4) compiler
 - (5) interpreter
4. It is the program that manages the hardware of the computer system including the CPU, memory storage devices and input/output devices.
 - (1) Software (2) Operating system
 - (3) Hardware (4) System software
5. An operating system is a/an [UPPSC Computer Assistant 2019, SSC CGL 2013]
 - (1) accounting software
 - (2) application software
 - (3) system software
 - (4) utility software
6. Which of the following is the correct reason to use an operating system?
 - (1) To manage resources
 - (2) To control the hardware
 - (3) To provide an interface between the hardware and user
 - (4) All of the above
7. The primary purpose of the Windows operating system is
 - (1) to make the most efficient use of the computer hardware
 - (2) to allow people to use the computer
 - (3) to keep systems programmer's employed
 - (4) to make computers easier to use
8. Every computer has a(n), many also have [RBI Grade B 2014]
 - (1) operating system; a client system
 - (2) operating system; instruction sets
 - (3) application programs; an operating system
 - (4) application programs; a client system
 - (5) operating system; application programs
9. Which of the following is/are function(s) of operating system?
 - (1) User interface
 - (2) File system manipulation
 - (3) Resource allocation
 - (4) All of the above
10. A program in execution is called
 - (1) process (2) instruction
 - (3) procedure (4) function
11. Memory utilisation factor shall be computed as
 - (1) memory in use/allocated memory
 - (2) memory in use/total memory connected
 - (3) memory allocated/free existing memory
 - (4) memory committed/total memory available
12. Which one of the following is not the function of operating system?
 - (1) Resource Management
 - (2) File Management
 - (3) Networking
 - (4) Processor Management
13. When a file contains instruction that can be carried out by the computer, it is often called a(n) file.
 - (1) data (2) information
 - (3) executable (4) application

- 14.** Grouping and processing all of a firm's transactions at one time, is called
(1) a database management system
(2) batch processing
(3) a real time system
(4) on-time system
- 15.** is used for very large files or where a fast response time is not critical. The files to be transmitted are gathered over a period and then send together as a batch.
(1) Batch processing (2) Online processing
(3) File processing (4) Data processing
- 16.** Which of the following system is a function of dedicated PCs?
(1) Meant for a single user
(2) Meant for the single task
(3) Deal with single software
(4) Deal with only editing
- 17.** Windows operating system is and
(1) multitasking, multi user
(2) multi user, single tasking
(3) single user, multitasking
(4) single tasking, single user
- 18.** Operating system that allows only one user to work on a computer at a time is known as [IBPS Clerk 2015]
(1) single user operating system
(2) multi user operating system
(3) single tasking operating system
(4) multitasking operating system
(5) real-time operating system
- 19.** An operating system is said to be multi user, if
(1) more than one programs can run simultaneously
(2) more than one users can work simultaneously
(3) Either (1) or (2)
(4) None of the above
- 20.** provides process and memory management services that allow two or more tasks, jobs or programs to run simultaneously.
(1) Multitasking (2) Multithreading
(3) Multiprocessing (4) Multicomputing
- 21.** Which of the following terms explains the execution of more than one file at the same on a single processor?
(1) Single tasking (2) Multitasking
(3) Scheduling (4) Multiprocessing
- 22.** is a feature for scheduling and multi-programming to provide an economical interactive system of two or more users. [IBPS Clerk 2012]
(1) Time sharing (2) Multisharing
(3) Time tracing (4) Multiprocessing
(5) None of these
- 23.** The simultaneously processing of two or more programs by multiple processors, is
(1) multiprogramming (2) multitasking
(3) time sharing (4) multiprocessing
- 24.** Real time systems must have
(1) pre-emptive kernels
(2) non-pre-emptive kernels
(3) Both (1) and (2)
(4) Either (1) or (2)
- 25.** RTOS stands for
(1) Real Time Operating System
(2) Reliable Time Operating System
(3) Reboot Time Operating System
(4) None of the above
- 26.** System running more than one processes concurrently are called [SSC CGL 2016]
(1) multiprocessing
(2) multiprogramming
(3) real time
(4) batch processing
- 27.** Which of the following refers to the means by which an OS or any other program interacts with the user? [SBI Clerk 2014]
(1) Program front-end
(2) Programming interface
(3) User login
(4) User interface
(5) User compatibility
- 28.** The first graphical user interface was designed by
(1) Apple Inc. (2) Microsoft
(3) Xerox Corporation (4) None of these

- 29.** Which process refers to the starting up of a computer and the loading of the required parts of the operating system into the RAM?
[SSC CGL 2018]
- (1) Swapping (2) Booting
(3) Mapping (4) Tagging
- 30.** Which process checks to ensure the components of the computer are operating and connected properly?
- (1) Booting (2) Processing
(3) Saving (4) Editing
- 31.** What happens when you boot up a PC?
[RBI Grade B 2012]
- (1) Portions of the operating system are copied from disk into memory
(2) Portions of the operating system are copied from memory onto disk
(3) Portions of the operating system are compiled
(4) Portions of the operating system are emulated
(5) The PC gets switched off
- 32.** What do you understand by the term booting?
[RBI Grade B 2012]
- (1) The process of starting the computer from the power-off position
(2) Connecting computer of the electric switch
(3) Increasing the memory of the computer
(4) The process of shut down the computer
(5) None of the above
- 33.** Restart of computer is called when computer is already ON.
- (1) cold booting (2) warm booting
(3) shut down (4) logging off
- 34.** The first version of Unix was developed by
- (1) Ken Thompson (2) Presper Eckert
(3) J W Mauchly (4) Herman Hollerith
- 35.** UNIX operating system is generally known as
[SSC CGL 2014]
- (1) Multi user operating system
(2) General application
(3) Single user operating system
(4) Single user application program
- 36.** Which is the programming tool in UNIX?
[UPPSC Computer Assistant 2019]
- (1) LINT (2) KERNEL
(3) C-Shell (4) None of these
- 37.** In computers, what does Yosemite, Mavericks, Mountain Lion, Lion Snow Leopard, Leopard, Tiger, Tiger Panther, Jaguar, Puma and Cheetah stand for?
[RRB NTPC 2016]
- A. Versions of Mac OSX
B. Types of storage servers
C. Macintosh clones
D. None of the above
- (1) D (2) A
(3) C (4) B
- 38.** Which of the following is an operating system?
[SBI Clerk 2014]
- (1) Linux (2) Debugger
(3) Mozilla (4) Google Chrome
(5) Intel 8085
- 39.** Linux is a type of software.
- (1) shareware (2) commercial
(3) proprietary (4) open source
- 40.** Which one of the following is not an operating system?
[SSC CGL 2018]
- (1) Linux (2) Unix
(3) Intel (4) Windows
- 41.** Who developed the operating system Linux started as a project by a student of Finland?
[SSC CGL 2018]
- (1) Barbara Liskov
(2) Linus Torvalds
(3) Leonard M. Adleman
(4) Leslie Lamport
- 42.** Which of the following operating systems was first developed by Microsoft?
- (1) Windows ME (2) Windows NT
(3) Windows 97 (4) MS-DOS
- 43.** Which one of the following file names is invalid in DOS?
[RBI Grade B 2013]
- (1) RIT.bat (2) LISTEN.bin
(3) RLUA.btt (4) TALK.bas
(5) None of these
- 44.** Which one of the following DIR commands lists a group of files?
[RBI Grade B 2013]
- (1) DIR INVOICE.bas (2) DIR RESCUE.bas
(3) DIR PAYROLL.bas (4) DIR TOOL?.bas
(5) None of these

45. 'DOS' floppy disk/operating system does not have [SBI PO 2014]
(1) a boot record (2) a file allocation table
(3) a root directory (4) a virtual memory
(5) All of these
46. Which file in MS-DOS contains internal commands that are loaded during booting process?
(1) CONFIG.sys (2) MSDOS.sys
(3) BIOS.sys (4) COMMAND.com
47. What is the name of the batch file that automatically run when MS-DOS is booted?
(1) Config.sys (2) Config. bat
(3) Autoexe.bat (4) Run.bat
48. MS-DOS is usually supplied on a
(1) hard disk (2) cartridge tape
(3) CD ROM (4) floppy disk
49. Which of the following is the main program of MS-DOS?
(1) Boot Record (2) ID.sys
(3) MSDOS.sys (4) Command.com
50. Which of the following operating systems is also known as single user operating system?
(1) Windows (2) Linux
(3) Unix (4) DOS
51. The main difference between Windows and DOS is the ability to
(1) multitasking (2) speed up
(3) run a program (4) run without power
52. '>' symbol in DOS commands is used to
(1) compare two values (2) redirect input
(3) redirect output (4) filter data
53. Usually, in MS-DOS, the primary hard disk drives has the drive letter [RBI Grade B 2012]
(1) A (2) B
(3) C (4) D
(5) None of these
54. Which of the following is not usual file extension in DOS? [RBI Grade B 2012]
(1) .exe (2) .bat
(3) .0 (4) .com
(5) None of these
55. Which commands are automatically loaded into main memory?
(1) Internal (2) External
(3) Viral (4) Situational
56. Which type of commands in MS-DOS needs external files to perform their action?
(1) Internal commands
(2) External commands
(3) Batch commands
(4) Redirectories
57. Which one of the following DOS commands sends contents of the screen to an output device? [RBI Grade B 2013]
(1) BREAK (2) DISK COPY
(3) MORE (4) ASSIGN
(5) None of these
58. Which of the following is not an external command of DOS?
(1) LABEL (2) FORMAT
(3) CHKDSK (4) CLS
59. CHKDSK can be used to find
(1) disk's bad portion (2) occupied space
(3) free space (4) All of these
60. While working with MS-DOS, which command transfers a specific file from one disk to another?
(1) Copy (2) Disk copy
(3) Time (4) Rename
61. DEL command is used to
(1) delete files (2) delete directory
(3) delete lables (4) Both (1) and (2)
62. This command is used to display a list of files and sub-directories that are in the directory you specify.
(1) DER (2) DIS
(3) DIR (4) DAR
63. The purpose of DISKCOPY command is to [RBI Grade B 2014]
(1) format the disk if it is not formatted before a write operation is initiated on it
(2) overwrite the existing contents of the destination disk as it copies the new information to it
(3) make an exact copy of a floppy disk
(4) All of the above
(5) None of the above

- 64.** Which command is used to delete file from a directory in DOS?
(1) REN (2) DEL (3) CD (4) MD
- 65.** In MS-DOS, which of the following commands is used to delete directory with all sub-directories and files?
(1) Delete (2) Del (3) Deltree (4) Move
- 66.** Which one of the following DOS command sends contents of the screen to an output device?
(1) BREAK (2) DISK COPY
(3) MORE (4) ASSIGN
- 67.** In DOS, the DIR command is used to
(1) display content of a file [SSC CGL 2013]
(2) delete file
(3) display list of files and sub-directories
(4) copy files
- 68.** The DOS command, which cannot be executed with versions 1 and 2 is
[RBI Grade B 2014, RBI Grade B 2013]
(1) GRAPHICS (2) FIND
(3) LABEL (4) MODE
(5) None of these
- 69.** Which of the following is not an internal command of DOS?
(1) VER (2) COPY
(3) FORMAT (4) VOL
- 70.** Which one of the following is an MS-DOS external command? [SSC CHSL 2012]
(1) DIR (2) COPY
(3) FORMAT (4) PROMPT
- 71.** A command, in DOS, used to set a name to a disk, is
(1) VOL (2) REN
(3) LABEL (4) CLS
- 72.** In DOS, the 'label' command is used to
(1) create the label of disk
(2) change the label of disk
(3) remove the label of disk
(4) Both (1) and (2)
- 73.** Which among the following is not a mobile operating system? [IBPS PO 2016]
(1) Android (2) Safari
(3) Symbian (4) iOS
(5) BlackBerry

ANSWERS

| | | | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. (4) | 2. (1) | 3. (1) | 4. (2) | 5. (3) | 6. (5) | 7. (4) | 8. (5) | 9. (4) | 10. (1) |
| 11. (2) | 12. (3) | 13. (3) | 14. (2) | 15. (1) | 16. (1) | 17. (3) | 18. (1) | 19. (2) | 20. (1) |
| 21. (2) | 22. (1) | 23. (4) | 24. (1) | 25. (1) | 26. (2) | 27. (4) | 28. (3) | 29. (2) | 30. (1) |
| 31. (1) | 32. (1) | 33. (2) | 34. (1) | 35. (1) | 36. (2) | 37. (2) | 38. (1) | 39. (4) | 40. (3) |
| 41. (2) | 42. (4) | 43. (3) | 44. (4) | 45. (5) | 46. (3) | 47. (3) | 48. (1) | 49. (1) | 50. (4) |
| 51. (1) | 52. (3) | 53. (3) | 54. (3) | 55. (1) | 56. (2) | 57. (5) | 58. (4) | 59. (4) | 60. (1) |
| 61. (4) | 62. (3) | 63. (4) | 64. (2) | 65. (3) | 66. (2) | 67. (3) | 68. (3) | 69. (3) | 70. (3) |
| 71. (3) | 72. (4) | 73. (2) | | | | | | | |