

## Theoretical concepts of Operating System

### 1. Define Software.

- A software is **set of instructions** that perform **specific task**.
- It interacts with the **hardware** to generate the **output**.

### 2. What are the types of software? Explain.

Software is classified into two types:

- 1) **Application Software**
- 2) **System Software**

#### Application Software:

- Application software is a set of programs to perform **specific task**. Ex. MS-word ,VLC ,flash etc..

#### System Software:

- System software is a type of computer program that is designed to run the **computer's hardware** and **application programs**.  
Ex. Operating System , Language Processor

### 3. What is operating system?

- An Operating System (OS) is a **system software** which serves as an **interface** between a **user** and a **computer**.
- This **controls** input, output and other peripheral devices.
- Operating System **manages** all the **Software** and **Hardware**.
- Ex. Windows, Linux, Unix ,Android and iOS as Mobile OS.

### 4. What are the Uses of Operating Systems?

#### Explain the main purpose of an operating system.

- To ensure that a computer can be used to extract what the user wants it do.
- Easy interaction between the **users** and **computers**.
- **Starting** computer operation **automatically** when power is turned on (**Booting**).
- Controlling **Input** and **Output** Devices
- Manage the utilization of **main memory**.
- Providing **security** to user programs

### 5. What are the types of Operating System? Explain.

Operating System are classified into the following types,

- **Single User Operating Systems**
- **Multi-user Operating Systems**

### Single User Operating Systems

- An operating system allows only a single user to perform **a task at a time**.
- It is called as a **Single user** and **single task** operating system. Ex. MS-DOS

### 6. Multi-user Operating Systems

#### What is the multi-user Operating system?

- It allows same data and applications to be accessed by **multiple** users at the **same time**.
- The users can also communicate with each other.  
Ex. Windows, Linux and UNIX

### 7. What is User Interface?

- User interface is one of the significant feature in Operating System.
- The only way that user can make interaction with a Computer.

### 8. What is GUI ?

- The GUI is a window based system with a **pointing device** to direct **I/O**, choose from **menus**, make **selections**, **pop up** window message boxes, **icons**, vibrant **colours** are attract the user very easily.

### 9. What are the points to be considered when user interface is designed?

- The user interface should enable the user to retain a longer time.
- The user interface should also satisfy the customer based on their needs.
- Create graphical elements like Menus, Window, Tabs,
- Icons and reduce typing work will be an added advantage of the Operating System.
- The ultimate aim of any product is to satisfy the customer.

### 10. What is Memory Management in OS? or

#### What are the advantages of memory management in Operating System?

- Memory Management is the process of controlling and coordinating computer's main memory .
- Memory management ensures the availability of memory for each running program at all times.
- The Memory management involves the allocation de-allocation of memory blocks

### 11. What is Process management in OS? What are the activities associated with the computer process?

- Process management is function that includes **creating** and **deleting** processes.
- Providing mechanisms for processes to **communicate** and **synchronize** with each other.

**12.What are the categories of computer process?**

- Operating System processes which is executed by **system code**
- User Processes which is execute by **user code**

**13. List the algorithms used to allocate the job in computer. Explain. or****Explain the algorithms used in process management.**

1. FIFO 2. SJF 3. Round Robin 4. Based on Priority

**1. FIFO (First In First Out)Scheduling:**

- This algorithm is based on **queuing** technique  
The process that enters the queue **first** is executed **first** by the CPU, followed by the next and so on.

**2. SJF (Shortest Job First)Scheduling:**

- This algorithm works based on the **size** of the job being executed by the CPU.

Consider two jobs A and B. 1) A = 6 KB 2) B = 9 KB  
First the job "A" will be assigned and then job "B"

**3.Round Robin Scheduling**

- It is designed especially for **time sharing** systems.  
Ex. Take three jobs A, B, C.

First the job A is assigned to CPU then job B and job C  
and then again A, B and C and so on.

**4.Based On Priority**

- The given job (process) is assigned based on a **Priority**.

Take two jobs A and B. Let the priority of A be **5** and  
priority B be **7**.

Job B is assigned first.

**14.Explain Security Management in OS. Or****What are the Security levels in OS.****What are the security management features available in Operating System ?**

- It is used to protect data from hackers.
- The Operating System provides three levels of securities to the user end. They are  
(1) File access level  
(2) System level  
(3) Network level

**15.Define Fault Tolerance of computer.**

- The Operating Systems should be designed strongly.
- When there a fault, the Operating System should **not crash**.
- because it has fault tolerance capabilities and **retain** the **existing state** of system.

**16.What is File Allocation Table (FAT)?**

- File Allocation Table (FAT) is a file management technique in operating system.
- **Any type of data** in a computer is stored in the form of **files** and directories/folders through File Allocation Table (FAT).
- The FAT stores general information about files like filename, type (text or binary), size, starting address and access mode.

**17.Explain File Management in OS.**

- File management is an important function of OS
- The operating System manages the files, folders and directory systems on a computer.
- Any type of data in a computer is stored in the form of files and directories/folders through File Allocation Table (FAT).
- The FAT stores general information about files like filename, type (text or binary), size, starting address and access mode .
- The file manager of the operating system helps to create, edit, copy, allocate memory to the **files** and also updates the FAT.
- The OS also takes care of the files that are opened with proper **access rights** to read or edit them.
- There are few other file management techniques available like

1.Next Generation File System (NTFS)

2.ext2(Linux).

**18.Write short note on Multi-Processing.**

- It has **two** or **more** processors for a **single running** process (job).
- **Processing** takes place in **parallel** is known as parallel processing.
- Each processor works on **different parts** of the **same task** or on two or more **different tasks**.
- which increases the **power of computing**.

**19.Explain how Time-sharing works on computer with an example ? or Define Time-sharing.****What are the advantages and disadvantages of Time-sharing features?**

- It allows **execution of multiple** tasks or processes **concurrently** for each task a **fixed time** is allocated.
- This division of time is called **Time- sharing**.
- The processor switches **rapidly** between various processes after a time is elapsed or completed.

**Disadvantages.**

- Problem of data communication.
- Problem of reliability.

Assume three processes called **P1, P2, P3** .Time allocated for each process **30, 40,50** min.res.

- If the process **P1** completes within **20** minutes
- Then processor takes the next process **P2** .
- If the process **P2** could not complete within **40** minutes,
- then the current process **P2** will be paused and switch over to the next process **P3**.

**20.What is Distributed Operating Systems?****Explain the concept of a Distributed Operating System.****Ref .Qno 20 ,21**

- The Distributed Operating System is used to access shared data and files that reside in **any machine around the world.**
- The user can handle the data from different **locations.**
- The users can access as if it is available on their own computer.

**21.What are the advantages of distributed Operating System?**

- A user at **one location** can make use of all the resources available at **another location** over the network.
- Many computer resources can be **added easily** in the network
- Improves the **interaction** with the customers and clients.
- **Reduces** the load on the host computer.

**22.Give some list of Prominent OS. Or****What are the different Operating Systems used in computer?**

- UNIX
- Microsoft Windows
- Linux
- iOS
- Android

**23.Define UNIX.**

- UNIX is a **multitasking, multi-user** operating systems developed from **AT&T Bell Labs** in the **1970s** by **Ken Thompson** and **Dennis Ritchie.**

**24.Define Linux**

- Linux is a open-source operating systems.
- It can be **modified** and **distributed** by **anyone** around the world.
- There are many versions (distributions)and their updates.
- Ex. Ubuntu, Mint, Fedora, RedHat, Debian, Google's Android, Chrome OS, and Chromium OS
- Most of the servers run on Linux because it is **easy** to **customize.**

**25.What are the different distributions of Linux?**

Ubuntu, Mint, Fedora, RedHat, Debian, Google's Android, Chrome OS, and Chromium OS etc..

**26.List some Mobile operating system. Or****Explain and List out examples of mobile operating system.**

- Mobile devices such as phones, tablets and MP3 players are different from desktop and laptop computers.
- Hence they need special Operating Systems.
- Operating systems for mobile are not able to run all software.

Ex. **Apple iOS** and **Google Android.**The **iOS** running on an iPad**27.Write short note on Android**

- **Android** is a mobile operating system developed by **Google**, based on **Linux** for touch screen mobile devices .

Google has further developed

- **Android TV** for televisions,
- **Android Auto** for cars and
- **Android Wear** for wrist watches.

**28.Write short note on iOS**

- **iOS** is a mobile Operating System created and developed by **Apple Inc.,** exclusively for its iPhone, iPad and iPod Touch.
- It is the second most popular mobile Operating System globally after Android.

**29.What are the differences between Windows and Linux Operating system?**

Windows	Linux
Commercial software	Open source software.
It can be modified and distributed by anyone .	It can only be modified and distributed by the company that owns it.
They have their own versions Ex. Windows xp, Windows 7, Windows8 , Windows10	There are different distributors ex. ubuntu,fedora,redhat, linux mint etc.

**30.Explain advantages and disadvantages of open source operating systems.**

Advantages	Disadvantages
Free software	It supports limited software only
It can be modified and distributed by anyone .	Hardware and Software compatibility is poor
More reliable , flexible	Lack of user friendly

