

**SRI SAI RAM ENGINEERING COLLEGE**  
**DEPARTMENT OF INFORMATION TECHNOLOGY**  
**III YEAR/V SEMESTER (A & B)**  
**CS1252-OPERATING SYSTEMS**  
**Unit-I (2 marks Questions & Answers)**

**UNIT I**

**1. What is an Operating system?**

An operating system is a program that manages the computer hardware. It also provides a basis for application programs and act as an intermediary between a user of a computer and the computer hardware. It controls and coordinates the use of the hardware among the various application programs for the various users.

**2. Why is the Operating System viewed as a resource allocator & control program?**

A computer system has many resources – hardware & software that may be required to solve a problem, like CPU time, memory space, file-storage space, I/O devices & so on. The OS acts as a manager for these resources so it is viewed as a resource allocator.

The OS is viewed as a control program because it manages the execution of user programs to prevent errors & improper use of the computer.

**3. What is the Kernel?**

A more common definition is that the OS is the one program running at all times on the computer, usually called the kernel, with all else being application programs.

**4. What are Batch systems?**

Batch systems are quite appropriate for executing large jobs that need little interaction. The user can submit jobs and return later for the results. It is not necessary to wait while the job is processed. Operators batched together jobs with similar needs and ran them through the computer as a group.

**5. What is the advantage of Multiprogramming?**

Multiprogramming increases CPU utilization by organizing jobs so that the CPU always has one to execute. Several jobs are placed in the main memory and the processor is switched from job to job as needed to keep several jobs advancing while keeping the peripheral devices in use. Multiprogramming is the first instance where the Operating system must make decisions for the users. Therefore they are fairly sophisticated.

**6. What is an Interactive computer system?**

Interactive computer system provides direct communication between the user and the system. The user gives instructions to the operating system or to a program directly, using a keyboard or mouse ,and waits for immediate results.

7. **What do you mean by Time-sharing systems?**

Time-sharing or multitasking is a logical extension of multiprogramming. It allows many users to share the computer simultaneously. The CPU executes multiple jobs by switching among them, but the switches occur so frequently that the users can interact with each program while it is running.

8. **What are multiprocessor systems & give their advantages?**

Multiprocessor systems also known as parallel systems or tightly coupled systems are systems that have more than one processor in close communication, sharing the computer bus, the clock and sometimes memory & peripheral devices. Their main advantages are

- Increased throughput
- Economy of scale
- Increased reliability

9. **What are the different types of multiprocessing?**

*Symmetric multiprocessing (SMP):* In SMP each processor runs an identical copy of the Os & these copies communicate with one another as needed. All processors are peers. Examples are Windows NT, Solaris, Digital UNIX, OS/2 & Linux.

*Asymmetric multiprocessing:* Each processor is assigned a specific task. A master processor controls the system; the other processors look to the master for instructions or predefined tasks. It defines a master-slave relationship. Example SunOS Version 4.

10. **What is graceful degradation?**

In multiprocessor systems, failure of one processor will not halt the system, but only slow it down. If there are ten processors & if one fails the remaining nine processors pick up the work of the failed processor. This ability to continue providing service is proportional to the surviving hardware is called graceful degradation.

11. **What is Dual- Mode Operation?**

The dual mode operation provides us with the means for protecting the operating system from wrong users and wrong users from one another. User mode and monitor mode are the two modes. Monitor mode is also called supervisor mode, system mode or privileged mode. Mode bit is attached to the hardware of the computer to indicate the current mode. Mode bit is '0' for monitor mode and '1' for user mode.

12. **What are privileged instructions?**

Some of the machine instructions that may cause harm to a system are designated as privileged instructions. The hardware allows the privileged instructions to be executed only in monitor mode.

13. **How can a user program disrupt the normal operations of a system?**

- A user program may disrupt the normal operation of a system by
- Issuing illegal I/O operations
  - By accessing memory locations within the OS itself
  - Refusing to relinquish the CPU

**14. How is the protection for memory provided?**

The protection against illegal memory access is done by using two registers. The base register and the limit register. The base register holds the smallest legal physical address; the limit register contains the size of the range. The base and limit registers can be loaded only by the OS using special privileged instructions.

**15. What are the various OS components?**

The various system components are

- Process management
- Main-memory management
- File management
- I/O-system management
- Secondary-storage management
- Networking
- Protection system
- Command-interpreter system

**16. What is a process?**

A process is a program in execution. It is the unit of work in a modern operating system. A process is an active entity with a program counter specifying the next instructions to execute and a set of associated resources. It also includes the process stack, containing temporary data and a data section containing global variables.

**17. What is a process state and mention the various states of a process?**

As a process executes, it changes state. The state of a process is defined in part by the current activity of that process. Each process may be in one of the following states:

- New
- Running
- Waiting
- Ready
- Terminated

**18. What is process control block?**

Each process is represented in the operating system by a process control block also called a task control block. It contains many pieces of information associated with a specific process. It simply acts as a repository for any information that may vary from process to process.

It contains the following information:

- Process state
- Program counter
- CPU registers
- CPU-scheduling information
- Memory-management information
- Accounting information
- I/O status information

19. **What are the use of job queues, ready queues & device queues?**

As a process enters a system, they are put into a job queue. This queue consists of all jobs in the system. The processes that are residing in main memory and are ready & waiting to execute are kept on a list called ready queue. The list of processes waiting for a particular I/O device is kept in the device queue.

20. **What is meant by context switch?**

Switching the CPU to another process requires saving the state of the old process and loading the saved state for the new process. This task is known as context switch. The context of a process is represented in the PCB of a process.

21. **Differentiate tightly coupled and loosely coupled systems.**

**LOOSELY COUPLED SYSTEM**

Each processor has its own local memory

Each processor can communicate with other all through communication lines

**TIGHTLY COUPLED SYSTEM**

Common memory is shared by many processors.

No need of any special communication lines.

22. **What is a real time system?**

A real time system has a well defined fixed time constraints. Processing must be done within the defined constraints, or the system will fail. It is often used as a control device in a dedicated application.

23. **What do you mean by system calls?**

System calls provide the interface between a process and the operating system, when a system call is executed it is treated as by the hardware as software interrupt.

Ex: create system call for creating a new process.

24. **What is scheduler?**

A process migrates between the various scheduling queues through out its life time. The os must select processes from these queues in some fashion. This selection process is called scheduler.

There are three types of scheduler:

- Long term scheduler

- Short term scheduler
- Medium term scheduler

**25. What is an independent process?**

A process is independent in the sense that it cannot affect or be affected by the other processes executing in the system. Any process that does not share data with other process is called an independent process.

**26. What is a cooperative process?**

A process is cooperating if it can affect or be affected by the other processes executing in the system. Any process that shares data with other processes is a co-operating process.

**27. What are the benefits of co-operating process?**

- Information sharing
- Computation speed
- Modularity
- Convenience

**28. How can a user program disturb the normal operation of a system?**

- Issuing illegal I/O operation.
- By accessing memory locations within the OS itself
- Refusing to relinquish the CPU

**29. What is the use of inter process communication?**

Inter process communication provides a mechanism to allow the co-operating process to communicate with each other and synchronises their actions without sharing the same address space. It is provided by a message passing system,.

**30. Write the types of system calls of file management.**

- Create a file & Delete a file
- Open and close a file
- Read, write and reposition a file
- Get file attributes & Set file attributes