SHORT TYPE QUESTIONS

1.Define operating system.

Operating system is a software that acts as an interface between the user of the computer and computer hardware.

2. What is system call?

System call is a routine which provides an interface to the services made available by an operating system**.**

3. What is starvation and give the solution for starvation?

Indefinite waiting or blockage of low priority processes for acquiring processor is called starvation. Aging is the solution for starvation problem.

4. Define the following terms i) Waiting time   ii) Throughput iii) Turnaround time

Waiting Time: The amount of time that a process spends waiting in the ready queue.

Throughput: The number of processes that are completed per unit time is called throughput.

Turnaround time: The time interval between submission of job and completion of job is called turnaround time.

5. Specify the requirements of critical section problem solution.

Mutual Exclusion: When one process is in the critical section, no other process is allowed to enter the critical section.

Progress: If no process is in the critical section and if some process wants to enter the critical section, then the processes which are not in the remainder section will take decision which process to enter in to critical section**.**

Bounded Waiting: There exists a limit on the no of times the other processes are allowed to enter their critical sections after the process has made a request to enter its critical section and before that is granted.

6. What is race condition?

When several processes access and manipulate same data concurrently, the outcome of execution depends on the particular order in which access takes place.

7. Define dispatch latency.

The time it takes for the dispatcher to stop one process and start another process to run is known as dispatch latency.

8. What are the benefits of multithreaded programming?

1. Responsiveness : Multithreading in an interactive application may allow a program to continue running even if a part of it is blocked or is performing a lengthy operation, thereby increasing responsiveness to the user**.**

2. Resource Sharing –
Processes may share resources only through techniques such as-

- Message Passing
- Shared Memory

Threads share the memory and the resources of the process to which they belong by default. The benefit of sharing code and data is that it allows an application to have several threads of activity within same address space.

3.Economy   **–**
Allocating memory and resources for process creation is a costly job in terms of time and space. Since, threads share memory with the process it belongs, it is more economical to create and context switch threads. Generally much more time is consumed in creating and managing processes than in threads.

4.Scalability   **–**
The benefits of multi-programming greatly increase in case of multiprocessor architecture, where threads may be running parallel on multiple processors. If there is only one thread then it is not possible to divide the processes into smaller tasks that different processors can perform. Single threaded process can run only on one processor regardless of how many processors are available.

Multi-threading on a multiple CPU machine increases parallelism.

9. What are the different modes of operating system?

1. User Mode

The system is in user mode when the operating system is running a user application such as handling a text editor. The transition from user mode to kernel mode occurs when the application requests the help of operating system or an interrupt or a system call occurs.

The mode bit is set to 1 in the user mode. It is changed from 1 to 0 when switching from user mode to kernel mode.

2. Kernel Mode

The system starts in kernel mode when it boots and after the operating system is loaded, it executes applications in user mode. There are some privileged instructions that can only be executed in kernel mode. The mode bit is set to 0 in kernel mode.

10. Differentiate between preemptive and non preemptive scheduling.

In non preemptive scheduling once the CPU has been allocated to a process, the process keeps the CPU until it releases voluntarily either by terminating or by switching to waiting state.

In preemptive scheduling, once the CPU has been allocated to a process and while it is running if a process with high priority enters into ready state, then the running process will be preempted in the middle and CPU will be allocated to high priority process

ESSAY TYPE QUESTIONS

1. Explain Interprocess Communication in detail.

Processes can communicate with each other through both:

1. Shared Memory
2. Message passing

2. Discuss Multithreading models with neat diagrams.

3. Problems on CPU scheduling algorithms – FCFS, SJF, SRTF, Priority preemptive and non preemptive, Round Robin (Calculation of Average Waiting Time and Average Turnaround Time)

4. Critical Section problem – two process software solution

5. Write short notes on

i) PCB

ii) Operations on processes

6. Draw and explain the following

i) Process state diagram

ii) Queueing diagram

7. What is semaphore and provide solution to Dining Philosophers problem