**5Operating Systems (16CS304)**

**1 Mark**

1. What is an Operating System?
2. Give examples of operating systems and mobile operating systems?
3. How multiprogramming differ multitasking.
4. List various structures of operating systems.

Simple

Non simple

Layred

Hybrid

Micro kernal

1. Give an examples for hybrid OS structures.

Apple Mac os x,NT kernel,xnu kernal

1. What is the disadvantage of monolithic and layered structure?
2. Process is \_\_\_\_\_\_\_\_\_\_\_

a. program in High level language kept on disk b. Contents of main memory

c. A program in execution d. A job in secondary storage

1. Process control block is also called as -----------.
2. What does program counter indicate?
3. Draw a diagram for process states.
4. Define queueing diagram.
5. What does scheduler do?
6. Differentiate long term scheduler and short term scheduler.
7. Differentiate CPU bound process and I/O bound processes
8. When fork( ) is given.
   1. It creates a child process b. Allocates slot in process table

c. Returns 0 to parent & ID to child d. All of the above

1. The number of processes completed per unit time is known as \_\_\_through output\_\_\_\_\_.
2. Differentiate independent and cooperating process.

A **process** is **independent** if it cannot affect other other **process** or be affected by it. Any **process** that does not share data with others is **independent**. Otherwise the**process** is **cooperating**.

1. Give various reasons for providing an environment that allows process cooperation.

Data sharing,modularity,execution speedup

1. Give various scheduling criteria's.
2. Which of the following scheduling algorithm could result in starvation?

a) FCFS b) SJF c) Round Robin d) Priority.

1. Which of the following statements are true?

i) Shortest remaining time first scheduling may cause starvation

ii) Preemptive scheduling may cause starvation

iii) Round robin is better than FCFS in terms of response time

a) I only b) II and III only c) I and III only d) I, II and III

1. Define the burst time and arrival time of the process.

**Arrival Time**: **Time** at which the process arrives in the ready queue.

**Burst Time**: **Time**required by a process for CPU execution

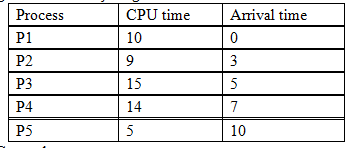
1. What is the turnaround time and waiting time of the process?
2. Differentiate preemptive and non-preemptive scheduling.
3. Which of the following CPU scheduling algorithms will prevent starvation problem?
   1. Shortest-job-first b) Priority-scheduling
   2. Priority-scheduling with aging mechanism d) None of the above
4. Define symmetric multiprocessing (SMP).

 is the processing of [program](https://searchsoftwarequality.techtarget.com/definition/program)s by multiple [processor](https://whatis.techtarget.com/definition/processor)s that share a common [operating system](https://whatis.techtarget.com/definition/operating-system-OS) and [memory](https://searchstorage.techtarget.com/definition/memory-card).

1. Define Critical Section.
2. What does turn variable and flag array indicate?
3. List the requirements to satisfy for the solution of critical section problem.
4. Define race condition.

10 Marks

1. Describe the performance of the FCFS , SJF(preemptive), and RR(time slice = 4) scheduling algorithms on the jobs given below:



1. Draw the Gantt charts
2. Calculates the turnaround time for each process.
3. Calculates the waiting time for each process.
4. Calculates the average waiting and turnaround time for each process.
5. Explain SJF scheduling algorithm with an example.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Process | P1 | P2 | P3 | P4 |
| Burst time | 6 | 8 | 7 | 3 |

1. CPU burst time indicates the time, the process needs the CPU. The following are the set of processes with their respective CPU burst time (in milliseconds).

Processes CPU Burst time

P1 10

P2 5

P3 5

Calculate the average waiting time if the process arrived in the following order:

1. P1, P2 & P3 b) P2, P3 & P1
2. Consider the following table showing different jobs with their arrival time, priority, time of execution etc. Let the system do the scheduling in the following way. Initially the system starts with a round-robin scheduling with a time quantum of 1 unit. After half of the number of jobs is completed, the system starts using non-preemptive priority based scheduling. Assume lower priority value means higher priority. Calculate the following parameters in such a scheduling.

i. Average waiting time

ii. Average turnaround time



1. Compute average turnaround time and average waiting time for the following four processes. Using ROUND ROBIN with Time quantum 2 unit (RR2).



1. Consider the following set of processes, with the length of the CPU burst given in milliseconds: The processes are assumed to have arrived in the order P1, P2, P3, P4 all at time 0 and calculate the average waiting and average completion time using priority scheduling



1. Explain shortest job first scheduling algorithm. Calculate the average waiting time and turnaround time using FCFS and SJF algorithms with the following data.



1. a. Define process and write the state diagram of process.

b. Explain Process Control Block.

1. a. Explain critical section problem and requirements to be satisfied for solution to critical

section problem.

b. Explain about software-based Peterson’s solution to the critical section problem.

1. a. Describe the differences between symmetric and asymmetric multiprocessing. What

are the advantages and disadvantages of multiprocessor systems?

b. Write about Multi-level Queue Scheduling and Multi level Feedback Queue

5Scheduling (MFQ).