**SRM INSTITUTE OF SCIENCE AND TECHNOLOGY**

**CHENNAI**

**18CSC205J - OPERATING SYSTEMS**

**QUESTION BANK**

**UNIT – 2**

**4 MARKS**

1.Define process synchronization.

2.Defijne semaphore , binary semaphore.

3.Define CPU scheduling.

4.Define context switch.

5.List out the types of schedulings.

6.Differentiate preemptive scheduling and non preemptive scheduling.

7.Define input queue, waiting time, and turn around time.

8.Define FCFS.

9.Define SJFS.

10.Define RR scheduling.

11.Define priority scheduling.

12.What is called as deadlock?

13.Define the four necesssry conditions for the deadlock to occur in the system.

14.Define resource allocation graph alomg with example.

15.Define multilevel queue scheduling.

16.Define multilevel feedback scheduling.

17. Consider the following codes of two processes.

P1(){ C=B-1; B=2\*C; }, P2(){ D=2\*B; B=D-1; }. Suppose B is a shared variable with initial value 2. Find all the different possible value of B, after the execution of P1 and P2.

18. Briefly explained about critical section problem solution criteria

19. Brief the methods to recover a system from deadlock.

20. Write an algorithm solving critical solution problem for two processes

**12 MARKS**

1.Explain readers writers problem, bounded buffer problem and dining philosopher problem.

2. What is called as semaphore? Explain how synchronization is achieved with semaphore.

3.Explain petersons solution to solve the synchronizations problems occurring for two processes and multiple processes.

4.Explain the various strategies used to prevent deadlock.

4.Expalin Safe state algorithm, resource graph algorithm to avoid deadlock.

5.Expalin bankers algorithm to avoid deadlock along with neat example.

6. Given the following Resource allocation, Write the Need matrix and Is the system is in safe state? If so, write the safe sequence of process execution.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Process | Allocation | | Max  Available Resources  R1 🡪 1 & R2 🡪 1 | |
| R1 | R2 | R1 | R2 |
| P1 | 1 | 2 | 4 | 2 |
| P2 | 0 | 1 | 1 | 2 |
| P3 | 1 | 0 | 1 | 3 |
| P4 | 2 | 0 | 3 | 2 |

If a new request from process P4 arise as Request4(1,1) can it be granted by the OS.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7.Suppose that the following processes arrive for the execution at the times indicated. Each process will run the listed amount of time.   |  |  |  | | --- | --- | --- | | Process | Arrival Time | Burst Time | | P1 | 3 | 1 | | P2 | 1 | 4 | | P3 | 4 | 2 | | P4 | 0 | 6 | | P5 | 2 | 3 |  1. Find the average waiting time and average turnaround time using preemptive approach of SJF scheduling. 2. Find the average waiting time and average turnaround time using Round Robin scheduling approach. Assume the time quantum is 2. |

8. Consider the following 4 process , with the length of CPU burst time given in milliseconds

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Process | P1 | P2 | P3 | P4 |
| Arrival time | 0 | 1 | 2 | 3 |
| Burst time | 8 | 4 | 9 | 5 |

Consider the FCFS ,non preemptive SJF, preemptive Shortest job first (SJF) , Round robin (quantum time = 3 ms) scheduling algorithms. Illustrate the scheduling using Gantt chart and find the average waiting time and average turn around time. Which algorithm will give the minimum average waiting time ? Discuss.