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Description automatically generatedParul University**

**Faculty of Engineering & Technology**

**Parul Institute of Technology**

**Question Bank for Unit-1 to Unit-3**

Q.1. Define Process Scheduling in Operating Systems, explain its importance and Types.

Q.2. Explain the FCFS scheduling algorithm. What is the disadvantage of this scheduling algorithm?

Q.3. Discuss the Producer Consumer Problem. How does it introduce data inconsistency with synchronization?

Q.4. Define Inter-Process Communication (IPC) and explain its importance in a multi-process system.

Q.5. What is Mutual Exclusion, and how does it relate to the Critical Section Problem?.

Q. 6. Explain Peterson’s Solution to the Critical Section Problem.

Q.7. Explain Strict Alternation Solution for the Critical Section Problem

Q.8. Explain following terms:1.Semaphores 2. Event Counters 3. Monitors in IPC 4. Message Passing in IPC

Q.9 What is the Critical Section in Inter-Process Communication (IPC)?

Q.10 Compare and contrast different synchronization techniques (semaphores, monitors, message passing) with respect to:

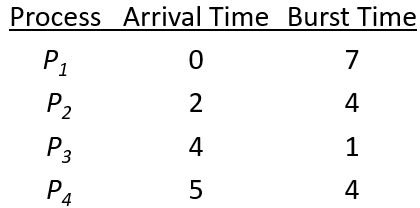
* Ease of use
* Performance
* Deadlock prevention
* Scalability in multi-core systems

Q.11. How do semaphores help in solving the Producer-Consumer problem, and what is the role of the buffer in this solution?

Q.12. How can message passing be used to solve the Producer-Consumer problem?

Q.13. Explain Peterson's solution to the critical section problem and highlight how it differs from the strict alternation approach

Q.14. Perform the shortest job first (SJF) pre-emptive scheduling based on following data:



Calculate the waiting time and turnaround time for individual processes. Also find out the average values of all the waiting and turnaround time.

Q.15. What are the differences between a process and a thread?

Q.16. What is the difference between a Monolithic Kernel and a Microkernel? Provide examples.

Q.17. What is the main difference between preemptive and non-preemptive scheduling?

Q.18. Explain the concept of mutual exclusion in the context of critical sections. How does mutual exclusion prevent race conditions?

Q.19. What is strict alternation in the context of process synchronization? Discuss the advantages and disadvantages of using strict alternation for mutual exclusion.

Q.20. Given the following process arrival times and burst times, calculate the Turnaround Time, Waiting Time, and Completion Time for the processes using FCFS scheduling.

| **Process** | **Arrival Time** | **Burst Time** |
| --- | --- | --- |
| P1 | 0 | 5 |
| P2 | 1 | 3 |
| P3 | 2 | 2 |
| P4 | 3 | 1 |

Q.21 Given the following set of processes with their burst times, calculate the average waiting time and average turnaround time using the Round Robin algorithm with a time quantum of 3 units.

| **Process** | **Arrival Time** | **Burst Time** |
| --- | --- | --- |
| P1 | 0 | 6 |
| P2 | 1 | 8 |
| P3 | 2 | 7 |
| P4 | 3 | 3 |

Q.22. Define the Operating System.

Q.23. What are the various main functions of OS?

Q.24. Describe the structure of the Process Control Block (PCB).

Q.25. What you understand about Context Switching

Q.26. What do you understand about threads? Explain the concept of multithreading in an

Operating System.

Q. 27. Differentiate Multitasking and Multiprocessing.