



Parul University
Faculty of Engineering and Technology
Parul Institute of Engineering and Technology
Artificial Intelligence and Data Science Department

Subject Name	OPERATING SYSTEM	A.Y	2025-2026
Subject Code	303105251	Semester	4th

Assignment-1

Sr No	Question	COs	B.T	Competence
1	Explain the basic concept of an Operating System and list any five major functions of OS.	CO-1	1	Remember
2	Describe different generations of Operating Systems with suitable examples.	CO-1	2	Understand
3	What are the different types of Operating Systems? Explain any three types in detail.	CO-1	2	Understand
4	Define System Calls. Explain different categories of system calls with examples.	CO-1	2	Understand
5	Compare the Monolithic, Layered, and Microkernel structures of an Operating System.	CO-1	4	Analyze
6	What is a Virtual Machine? Explain its architecture and advantages.	CO-1	3	Apply

Assignment-2

1	Define a process. Explain different states of a process with a neat state transition diagram.	CO-5	1	Remember
2	What is PCB (Process Control Block)? Explain its components in detail.	CO-5	2	Understand
3	Differentiate between Process and Thread. Explain benefits of multithreading.	CO-5	2	Understand
4	Explain CPU Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, and Response Time.	CO-5	2	Understand
5	Describe Pre-emptive and Non-preemptive scheduling with examples.	CO-5	4	Analyze
6	Explain Round Robin scheduling algorithm with an example. Calculate waiting and turnaround time.	CO-5	3	Apply

Assignment-3

1	Explain the concept of Critical Section and Race Conditions with suitable examples.	CO-6	1	Remember
2	Describe Mutual Exclusion. Explain Peterson's solution for mutual exclusion.	CO-6	2	Understand
3	What are Semaphores? Explain types of semaphores with examples.	CO-6	2	Understand
4	Explain Producer-Consumer problem using semaphore-based solution.	CO-6	3	Apply
5	What are Monitors? Compare Monitors and Semaphores.	CO-6	4	Analyze
6	Explain the Dining Philosopher Problem and suggest a possible solution.	CO-6	4	Analyze