	OPERATING SYSTEMS			
	UNIT-1			
S. NO.	**QUESTION**	**Read**	**Date**	
1	Define operating system.	√	04-03-26	
2	Outline the operating system functions.	√	04-03-26	
3	Explain the two modes of operating system operations.	√	04-03-26	
4	Explain any two computing environments.	√	04-03-26	
5	List the examples of open source operating systems.	√	04-03-26	
6	Describe the operating system services.	√	05-03-26	
7	Compare the command-line interface (CLI) with graphical user interfaces (GUI).	√	05-03-26	
8	Define system call.	√	05-03-26	
9	Summarize the file management system calls.	√	05-03-26	
10	Outline the design goals of operating system.	√	05-03-26	
S. NO.	**QUESTION**	**Read**	**Write**	**Date**
1	Explain the difference between the user view and system view of an operating system.	√		06-03-26
2	Outline different types of operating system interfaces.	√		06-03-26
3	Summarize the operating system operations.	√		06-03-26
4	Explain how an operating system handles protection and security.		√	07-03-26
5	Explain various operating system functions.		√	07-03-26
6	Summarize the operating system services.		√	07-03-26
7	Outline different types of user and operating system interfaces.	√		08-03-26
8	What is a system call? Explain exactly how a system calls switches a process to kernel mode during its execution and how is it switched back to user mode on return from a system call.		√	08-03-26
9	Summarize about the system programs.	√		08-03-26
10	Explain the purpose of all types of system calls and discuss the calls related to Process Control, device management in detail.		√	08-03-26
	UNIT-2			
S. NO.	**QUESTION**	**Read**	**Date**	
1	Explain what is a process.	√	09-03-26	

2	Compare program and process.	√	09-03-26	
3	Explain about the process states.	√	09-03-26	
4	Summarize the usage of PCB (Process Control Block).	√	09-03-26	
5	Explain the functionality of dispatcher.	√	09-03-26	
6	Explain starvation and aging	√	10-03-26	
7	Differentiate between independent and cooperative process.	√	10-03-26	
8	Differentiate between a thread and a process.	√	10-03-26	
9	Outline the advantages of inter-process communication.	√	10-03-26	
10	Outline the scheduling criteria.	√	10-03-26	
S. NO.	**QUESTION**	**Read**	**Write**	**Date**
1	A) Explain about the process. Show various process states. B) Explain about Process Control Block.		√	11-03-2026
2	A) Outline Process Scheduling and Process Scheduling Queues. B) Explain briefly about different types of Schedulers.		√	11-03-2026
3	A) Explain about Context switching. B) Explain the operations that can be performed on a process.	√		12-03-26
4	A) Summarize how Inter Process Communication takes place. B) Explain about Message Passing Systems.	√		12-03-26
5	A) Outline different Multithreading Models. B) Explain different Threading Issues in Operating Systems.	√		12-03-26

6	A) Consider the following set of processes arrives at time 0 with the length of CPU burst given in milliseconds for the processes P1, P2, P3. Identify the waiting time, average waiting time of the processes if the processes arrive in order P1, P2, P3 and P2, P3, P1 using FCFS scheduling. B) Consider the following set of processes, with the length of the CPU burst given in milliseconds. By using SJF Scheduling, inspect the weighting time and average waiting time.				13-03-26
6					

Process	Burst Time
P1	24
P2	3
P3	3

Process	Arrival Time	Burst Time
P1	0.0	6
P2	0.0	8
P3	0.0	7
P4	0.0	3

7		A) Consider the following set of processes, with the length of the CPU burst given in milliseconds. Experiment with Non-Preemptive (or) SRTF scheduling to find the waiting time and average waiting time of the processes. B) Consider the following arrival time and burst time for processes P1, P2, P3, P4. Analyze average waiting time of processes by considering the Non-Preemptive and Preemptive Scheduling Algorithm.			13-03-26

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

Process	Arrival Time	Burst Time
P1	0	7
P2	2	4
P3	4	1
P4	5	4

	8	A) Consider the following arrival time and burst time for processes P1, P2, P3, P4. Identify the Total Waiting Time, Average Waiting Time and Average Turnaround Time of processes using SJF. B) Consider the following burst time and priority for different processes, find the waiting time and average waiting time of processes using Priority Scheduling.				13-03-26
8						

Process	Arrival Time	Burst Time
P1	0	4
P2	1	3
P3	2	1
P4	3	2
P5	4	6

Process	Arrival Time	Burst Time
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

9	A) Consider the processes and burst time with time quantum of 4 milliseconds. Identify the waiting time and average waiting time of different processes using Round Robin Scheduling. Process | Burst Time P1 | 24 P2 | 3 P3 | 3 B) Consider the processes and burst time with time quantum of 20 milliseconds. Identify the waiting time and average waiting time of different processes using Round Robin Scheduling. Process | Burst Time P1 | 53 P2 | 8 P3 | 68 P4 | 24			14-03-26

10	A) Consider the processes and burst time with time quantum of 4 milliseconds. Identify the waiting time and average waiting time of different processes using Round Robin Scheduling. Process | Burst Time P1 | 20 P2 | 12 P3 | 8 P4 | 16 P5 | 4 B) Demonstrate multiple processor scheduling.			14-03-26
	UNIT-3			
S. NO.	**QUESTION**	**Read**	**Date**	
1	Explain Race condition.	√	15-03-26	
2	Describe critical section problem.	√	15-03-26	
3	Explain Mutual Exclusion.	√	15-03-26	
4	Demonstrate operations that can be performed on semaphore.	√	15-03-26	
5	Explain Dead lock.	√	15-03-26	
6	Outline the necessary conditions for deadlock occurrence.	√	15-03-26	
7	Outline the necessary conditions for deadlock prevention.	√	15-03-26	
8	Explain safe state.	√	15-03-26	
9	Describe methods for Handling Deadlocks.	√	15-03-26	
10	Explain the usage of Monitor for synchronization construct.	√	15-03-26	
S. NO.	**QUESTION**	**Read**	**Write**	**Date**
1	A) Outline critical section problem. B) Explain Peterson solution to the critical section problem.		√	16-03-26

<table>
<tr><td>2</td><td>A) Explain about Mutex Locks.
B) Illustrate about Semaphores and their usage.</td><td></td><td>√</td><td>16-03-26</td></tr>
<tr><td>3</td><td>Make use of semaphores for solving
A) Bounded buffer problem.
B) Reader-Writer classical synchronization problem.</td><td></td><td>√</td><td>17-03-26</td></tr>
<tr><td>4</td><td>A) Develop a solution for dining philosopher’s problem using semaphores.
B) Utilize Monitors for solving process synchronization problem.</td><td></td><td>√</td><td>17-03-26</td></tr>
<tr><td>5</td><td>Explain about deadlock? Explain about the deadlock characterization in detail?</td><td>√</td><td></td><td>18-03-26</td></tr>
<tr><td>6</td><td>A) Explain the different methods for handling deadlocks.
B) Summarize briefly about the prevention the occurrence of deadlocks.</td><td>√</td><td></td><td>18-03-26</td></tr>
<tr><td>7</td><td>A) Explain about deadlock avoidance.
B) Explain in detail about Banker’s algorithm.</td><td></td><td>√</td><td>19-03-26</td></tr>
<tr><td>8</td><td>8
Consider the following snapshot of a system:
<table><tr><th>Process</th><th>Allocation</th><th>Max.</th><th>Available</th></tr><tr><td>P_0</td><td>0012</td><td>0012</td><td>1520</td></tr><tr><td>P_1</td><td>1000</td><td>1750</td><td></td></tr><tr><td>P_2</td><td>1354</td><td>2356</td><td></td></tr><tr><td>P_3</td><td>0632</td><td>0652</td><td></td></tr><tr><td>P_4</td><td>0014</td><td>0656</td><td></td></tr></table>Answer the following questions by applying the Banker's Algorithm:
a) What is the content of the matrix Need?
b) Is the system in a safe state?
c) If a request from process P1 arrives for (0, 4, 2, 0), can the request be granted immediately?</td><td></td><td></td></tr>
<tr><td>8</td><td></td><td></td><td>√</td><td>19-03-26</td></tr>
</table>

9	9	Consider five processes P_0, P_1, P_2, P_3, P_4 with three resource types: A, B, C with 10, 5, 7 instances. A snapshot of the system taken at time T_0 is shown below **Process / Allocation (A B C) / Max (A B C) / Available (A B C)** P_0: 0 1 0 / 7 5 3 / 3 3 2 P_1: 2 0 0 / 3 2 2 P_2: 3 0 2 / 9 0 2 P_3: 2 1 1 / 2 2 2 P_4: 0 0 2 / 4 3 3 By considering Bankers Algorithm, analyze the following: a) What will be the content of the Need matrix? b) Is the system in a safe state? If Yes, then what is the safe sequence? c) What will happen if process P1 requests one additional instance of resource type A and two instances of resource type C?		√	20-03-26
10	A) Summarize about deadlock detection? B) Explain how to recover from deadlocks?	√		20-03-26
	UNIT-4			
S. NO.	**QUESTION**	**Read**	**Date**	
1	Explain virtual address.	√	21-03-26	
2	Outline contiguous memory allocation?	√	21-03-26	
3	Explain hole?	√	21-03-26	
4	Explain External fragmentation?	√	21-03-26	
5	Explain Internal fragmentation?	√	21-03-26	
6	Describe paging?	√	22-03-26	
7	Explain Compaction?	√	22-03-26	

8	Summarize the steps in page fault service?	√	22-03-26	
9	Describe Belady's anomaly?	√	22-03-26	
10	Explain thrashing?	√	22-03-26	
S. NO.	**QUESTION**	**Read**	**Write**	**Date**
1	A) Explain in detail about swapping technique and its purpose? B) Explain about contiguous memory allocation?		√	23-02-26
2	A) Summarize about memory fragmentation? B) Explain about internal fragmentation and external fragmentation?	√		23-02-26
3	Explain about Paging.		√	23-02-26
4	A) Explain about segmentation hardware? B) Outline various page table structures.		√	24-03-26
5	A) Summarize about virtual memory? B) Explain about demand paging?	√		24-03-26
6	A) Explain the steps in handling page fault? B) Explain about page replacement?		√	24-03-26
7	Identify the number of page faults occurred When FIFO, LRU page replacement algorithms applied on the following memory string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 The number of frames available are 4.		√	25-03-26
8	Given five memory partitions of 100Kb, 500Kb, 200Kb, 300Kb, 600Kb (in order), Choose the first-fit, best-fit, and worst-fit algorithms place processes of 212 Kb, 417 Kb, 112 Kb, and 426 Kb (in order), Examine which algorithm makes the most efficient use of memory?		√	25-03-26
9	Consider the page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. If the page frame size is 3, Analyze the number of page faults by applying the following page replacement algorithms. a) FIFO Page Replacement b) Optimal Page Replacement c) LRU Page Replacement		√	26-03-26

10	Consider the order of request is 82, 170, 43, 140, 24, 16, 190. The current position of read/write head is 50. Identify the total seek time for the following a) FCFS Disk Scheduling b) SSTF Disk Scheduling c) SCAN Disk Scheduling d) CSCAN Disk Scheduling e) LOOK Disk Scheduling		√	26-03-26