



**SILVER OAK
UNIVERSITY**
EDUCATION TO INNOVATION

School of Technology, Design & Computer Application
Silver Oak College of Engineering & Technology
Bachelor of Technology
Computer Engineering / Information Technology /
Computer Science & Engineering / CSE - Cyber Security /
CE - AIML
Operating System

Semester:	4th	Academic Year:	2024 - 25
Course Name:	Operating System	Course Code:	1010043218

Question bank

Sr. No.	Question Text	Marks	CO
Unit No 1: Introduction			
1	Explain the objectives and functions of operating systems?	3	CO1
2	Explain basic services provided by the Operating system on bare Hardware machines?	3	CO1
3	What is System Call in OS? Explain fork () system call in UNIX OS?	4	CO1
4	List the types of operating systems and explain any one in detail?	3	CO1
5	Write a note on the Distributed Operating System. What is an Operating System? Give functions of Operating Systems.	4	CO1
6	Give the features of Real Time Operating System and Time-Sharing Operating System.	4	CO1
7	What is an operating System? Explain the abstract view of the components of a computer system.	4	CO1
8	Explain different types of OS and also Explain different types of tasks done by OS.	6	CO1
9	What is a system call? What is interrupt? How is it handled by the OS?	4	CO1
10	Give the features of Batch Operating System.	3	CO1
11	Give the advantages of Distributed Operating System	3	CO1
12	Write short notes on following: Real Time Operating System	4	CO1
13	Explain Goals of I/O Software.	3	CO1
Unit No 2 : Process and Threads Management:			



1	Differentiate process and thread. How do you create and terminate the process? Draw a diagram which indicates the state of processes.	8	CO 1																		
2	<p>Consider the following set of processes with the length of the CPU burst time given in milliseconds.</p> <table> <tr> <th>Process</th> <th>Arrival Time</th> <th>CPU Time</th> </tr> <tr> <td>P1</td> <td>0</td> <td>7</td> </tr> <tr> <td>P2</td> <td>3</td> <td>2</td> </tr> <tr> <td>P3</td> <td>4</td> <td>3</td> </tr> <tr> <td>P4</td> <td>4</td> <td>1</td> </tr> <tr> <td>P5</td> <td>5</td> <td>3</td> </tr> </table> <p>Draw a Gantt Chart and find out average waiting time and average turnaround time for (i) FCFS (ii) SJF (iii) RR</p>	Process	Arrival Time	CPU Time	P1	0	7	P2	3	2	P3	4	3	P4	4	1	P5	5	3	6	CO 1
Process	Arrival Time	CPU Time																			
P1	0	7																			
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P5	5	3																			
3	Consider Five Processes P1 to P5 arrived at the same time. They have estimated running time 10,2,6,8 and 4 seconds, respectively. Their Priorities are 3,2,5,4 and 1, respectively with 5 being the highest Priority. Find the average turnaround time and average waiting time for Round Robin(q=3) and Priority Scheduling algorithm.	6	CO 1																		
4	Give the difference between a Process and a Program	3	CO 1																		
5	Write different operating system services Explain multiprocessor operating system types in brief.	4	CO 1																		
6	Differentiate Multiprogramming, Multitasking, Multiprocessing & Distributed Operating System.	6	CO 1																		
7	Define a process. Explain the process state transition with a neat diagram.	4	CO 1																		
8	What is thread and what are the differences between user level threads and kernel supported threads? Under what circumstances is one type “better” than the other?	4	CO 1																		
9	<p>Find average waiting time for shortest job first scheduling, and round robin scheduling algorithm.</p> <table> <tr> <th>PROCESS</th> <th>CPU BURST TIME</th> </tr> <tr> <td>P1</td> <td>6</td> </tr> <tr> <td>P2</td> <td>8</td> </tr> <tr> <td>P3</td> <td>5</td> </tr> <tr> <td>P4</td> <td>25</td> </tr> </table>	PROCESS	CPU BURST TIME	P1	6	P2	8	P3	5	P4	25	6	CO 1								
PROCESS	CPU BURST TIME																				
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10	What is average waiting time and average turnaround time of all process for FCFS, SJF, non pre-emptive Priority, and Round Robin(Quantum =1) scheduling.	6	CO 1																		

	<p>P1 8 5</p> <p>P2 1 1</p> <p>P3 3 2</p> <p>P4 2 4</p> <p>P5 5 3</p> <p>The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time=0.</p>		
11	Define Process. List the major events for creation of a process and explain them	4	CO 1
12	What is PCB? Discuss its major fields.	4	CO 1
13	Draw a process state diagram for THREE states and explain all states.	4	CO 1
14	<p>Consider the following set of processes with length of CPU burst time given in milliseconds.</p> <p>P1 10 5</p> <p>P2 1 1</p> <p>P3 2 3</p> <p>P4 1 4</p> <p>P5 5 2</p> <p>Assume arrival order is: P1, P2, P3, P4, P5 at time 0,1,2,3,4 respectively and a smaller priority number implies a higher priority. Draw the Gantt charts for pre-emptive and Non preemptive priority scheduling. Calculate Average Turnaround Time and Average Waiting Time.</p>	6	CO 1
15	What is the process? What are the different types of states of any process? Explain different data structures to handle process management.	4	CO 1
16	Write short notes on following: (i)Multithreading	3	CO 1
17	What is thread? Explain thread structure.	3	CO 1
18	Explain PCB.	3	CO 1
19	What is a scheduler? Explain queuing diagram representation of process scheduler with figure.	4	CO 1
20	Define a distributed system. Explain the characteristics of a distributed system.	4	CO 1
21	Explain “5 State” Process Transition Diagram with illustration.	4	CO 1
22	What is the process? Explain Process State Transition Diagram in detail.	4	CO 1

23	What is the process? Explain Process State Transition Diagram in detail. Compare various disk arm scheduling algorithm.	4	CO 1																																																															
Unit No 3: Concurrency																																																																		
1	What Critical Section Problem and list the requirements to solve it. Write Peterson's Solution for the same.	4	CO 2																																																															
2	What is Semaphore? Give the implementation of Readers-Writers Problem using Semaphore.	4	CO 2																																																															
3	What is Monitor? Write Solution to Dining-Philosopher Problem Using monitor.	4	CO 2																																																															
4	What is Semaphore? Give the implementation of Bounded Buffer Producer Consumer Problem using Semaphore. Write pseudo code for the same.	4	CO 2																																																															
5	Define and explain following terms: (i) Authentication (ii) Mutual Exclusion (iii) Deadlock (iv) Segmentation.	6	CO 2																																																															
Unit 4 : Inter - Process Communication																																																																		
1	Explain the IPC Problem known as Dining Philosopher Problem.	6	CO 3																																																															
2	Define: Race Condition, Mutual Exclusion, Throughput.	6	CO 3																																																															
3	Explain the Problem of Critical Section (CSP) through Producer Consumer Problem. Explain any one Solution in detail.	6	CO 3																																																															
4	What is race condition? Explain the producer consumer problem with a fatal race condition.	4	CO 3																																																															
5	What is a deadlock? List the conditions that lead to deadlock.	4	CO 3																																																															
6	<table><thead><tr><th></th><th colspan="4">Allocation</th><th colspan="4">Max</th></tr><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th><th>A</th><th>B</th><th>C</th><th>D</th></tr></thead><tbody><tr><td>P₀</td><td>0</td><td>0</td><td>1</td><td>2</td><td>0</td><td>0</td><td>1</td><td>2</td></tr><tr><td>P₁</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>7</td><td>5</td><td>0</td></tr><tr><td>P₂</td><td>1</td><td>3</td><td>5</td><td>4</td><td>2</td><td>3</td><td>5</td><td>6</td></tr><tr><td>P₃</td><td>0</td><td>6</td><td>3</td><td>2</td><td>0</td><td>6</td><td>5</td><td>2</td></tr><tr><td>P₄</td><td>0</td><td>0</td><td>1</td><td>4</td><td>0</td><td>6</td><td>5</td><td>6</td></tr></tbody></table> <p>Consider the snapshot of the system with Five Processes and Four types of resources A, B, C, D. Currently Available set of resources is (1,5,2,0). Answer the following Questions using banker's algorithm.</p> <p>1) Find the content of Need Matrix.</p> <p>2) Is the System in Safe State?</p> <p>If a request from Process P1 arrives for (0,4,2,0) can the request be granted immediately.</p>		Allocation				Max					A	B	C	D	A	B	C	D	P ₀	0	0	1	2	0	0	1	2	P ₁	1	0	0	0	1	7	5	0	P ₂	1	3	5	4	2	3	5	6	P ₃	0	6	3	2	0	6	5	2	P ₄	0	0	1	4	0	6	5	6	8	CO 3
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7	List Deadlock Recovery Techniques and explain one of them.	4	CO 3																																																															
8	Define: Starvation	3	CO 3																																																															
9	What is Deadlock? List the conditions that lead to deadlock. How Deadlock can be prevented?	6	CO 3																																																															
10	Explain the use of Banker's Algorithm for multiple resources for Deadlock Avoidance with illustration.	4	CO 3																																																															
11	What is RAG? Explain briefly.	3	CO 3																																																															



12	Which are the necessary conditions for Deadlock? Explain Deadlock recovery in brief.	4	CO 3
13	Define mutual exclusion. How mutual exclusion can be achieved? Explain.	4	CO 3
Unit 5 : Memory Management			
1	Given memory partitions of 100K, 500K, 200K, 300K, and 600K in order, How would each of the First fit, Best fit and Worst fit algorithms place the processes of 212K, 417K, 112K and 426K in order? Which algorithm makes the most efficient use of memory? Show the diagram of memory status in each cases.	6	CO 2
2	Explain the following in brief: Multiprogramming with Fixed Partitions and Multiprogramming with Variable Partitions.	4	CO 2
3	For the Page Reference String: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0. 1. 7, 0, 1 calculate the Page Faults applying (i) Optimal (ii) LRU and (iii) FIFO Page replacement Algorithms for a Memory with three frames.	6	CO 2
4	Explain Swapping in Detail.	4	CO 2
Unit 6 : I/O Management & Disk scheduling			
1	Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk scheduling i) FCFS, ii) SCAN	8	CO 4
2	What are the uses of device drivers and controllers in OS?	4	CO 4
3	EXPLAIN: Direct Memory Access.	3	CO 4
4	Explain SSTF and LOOK disk scheduling Algorithms	4	CO 4
5	Explain Device Independent I/O software.	3	CO 4
6	Explain the following in brief: Elevator Algorithm.	3	CO 4
7	Explain any three Disk Arm Scheduling algorithms with suitable illustrations.	4	CO 4
8	Explain the goals of I/O software.	3	CO 4
9	Briefly describe SCAN	3	CO 4



10	Write a short note: RAID levels.	3	CO 4
11	Draw the block diagram for DMA. Write steps for DMA data transfer.	4	CO 4
12	Implement Protection Mechanism illustrating use of Protection Domain and Access Control List.	4	CO 4
13	Create the ways for user authentication? Explain each in brief.	4	CO 4
14	Explain domain protection mechanism in brief	3	CO 4
15	Explain the Trojan Horse and Trap doors program threats.	4	CO 4
16	Discuss some security goals.	3	CO 4
17	Explain the goals of Operating System Security.	3	CO 4
Unit 7 : Unix/Linux Operating System			
1	Give the functions of following UNIX commands:grep, cat, cmp, chmod ,finger,man Explain the following commands in UNIX: 7 suid, wall, man,finger,ls,cat,ps	8	CO5
2	What is “inode”? Explain File and Directory Management of Unix Operating System.	6	CO5
3	Explain Unix Commands: cat, sort, grep.	4	CO5
4	Explain Linux kernel and its functions in brief.	4	CO5