



Roll No

**PRESIDENCY UNIVERSITY
BENGALURU**

School Of Computer Science and Engineering & Information Science

Semester: MK

Course Code: CSE2010

Course Name: OPERATING SYSTEMS

Department: SOCSE

Date: 27-12-2025

Time: 01.00p.m. to 04.00 p.m.

Max Marks: 100

Weightage: 50%

Instructions:

- (i) Read the all questions carefully and answer accordingly.
(ii) Do not write any matter on the question paper other than roll number.

Q. No	Questions	Marks	CO	RBT
1	a. Define Operating System? Explain its goals and write what exactly an operating system does	4	CO1	L1
	b. Distinguish between concept of user view and system view with respect to operating system	6	CO1	L2
	c. Explain the different types of system calls in operating system	10	CO1	L3

OR

2	a. Briefly explain the components of computer system	4	CO1	L1
	b. Explain the concept of dual mode of operating in operating system	6	CO1	L2
	c. Explain the different types of system calls in operating system. Explain the different types of operating system services	10	CO1	L3

3	a. Explain how a process is different from a program	4	CO2	L1
	b. Explain PCB in Detail	6	CO2	L2
	c. Consider the following process scheduling table and apply Preemptive Priority Scheduling to calculate average waiting and turnaround times: Process Arrival Time Burst Time Priority P1 0 8 3 P2 1 4 1 P3 2 9 2 P4 3 5 2 P5 4 6 4	10	CO2	L3

OR

4	a. What is context switching? Describe the various scenarios in which context switching occurs	4	CO2	L1
	b. Explain how the process execution takes place with a process State diagram.	6	CO2	L2
	c. Apply SRTF Scheduling on the following table and compute average waiting and turnaround times: Process Arrival Time Burst Time P1 0 10 P2 1 5 P3 1 3 P4 3 2 P5 2 4 P6 4 5	10	CO2	L3

5	a. Explain the Critical section problem	4	CO3	L1
	b. Explain the concept of reader writers problem and also describe the solution given to it using semaphores	6	CO3	L2
	c. Given the process-resource allocation table, determine if the system is in a safe state using Banker's Algorithm and verify if a request for (0,1,1,3) from P2 can be granted. Process Allocation Max R1 R2 R3 R4 R1 R2 R3 R4 P0 2 0 0 1 4 2 1 2 P1 3 1 2 1 5 2 5 2 P2 2 1 0 3 2 3 1 6 P3 1 3 1 2 1 4 2 4 P4 1 4 3 2 3 6 6 5 Available resources: (3,3,2,1)	10	CO3	L3

OR

6	a. Explain how deadlocks can be detected and avoided using Resource allocation graph.	4	CO3	L1																																																													
	b. Explain the concept of dining philosophers problem, also Describe how the solution can be given using semaphores	6	CO3	L2																																																													
	a. Given the there are 5 process with four resource R1,R2,R3,R4 and The availability, allocation, maximum is given below <table border="1" style="margin-left: 20px;"> <thead> <tr> <th rowspan="2">Process ID</th> <th colspan="4">Allocation</th> <th colspan="4">Max</th> </tr> <tr> <th>R1</th> <th>R2</th> <th>R3</th> <th>R4</th> <th>R1</th> <th>R2</th> <th>R3</th> <th>R4</th> </tr> </thead> <tbody> <tr> <td>P0</td> <td>2</td> <td>0</td> <td>0</td> <td>1</td> <td>4</td> <td>2</td> <td>1</td> <td>2</td> </tr> <tr> <td>P1</td> <td>3</td> <td>1</td> <td>2</td> <td>1</td> <td>5</td> <td>2</td> <td>5</td> <td>2</td> </tr> <tr> <td>P2</td> <td>2</td> <td>1</td> <td>0</td> <td>3</td> <td>2</td> <td>3</td> <td>1</td> <td>6</td> </tr> <tr> <td>P3</td> <td>1</td> <td>3</td> <td>1</td> <td>2</td> <td>1</td> <td>4</td> <td>2</td> <td>4</td> </tr> <tr> <td>P4</td> <td>1</td> <td>4</td> <td>3</td> <td>2</td> <td>3</td> <td>6</td> <td>6</td> <td>5</td> </tr> </tbody> </table> <p>If the available of resources is <3,3,2,1> respectively of R1,R2,R3,R4. Check any safe sequence exists or not using bankers algorithm and If so give the safe sequence. Also check whether the request of P2 if it arrives for <0,1,1,3> can be granted immediately or not.</p>	Process ID	Allocation				Max				R1	R2	R3	R4	R1	R2	R3	R4	P0	2	0	0	1	4	2	1	2	P1	3	1	2	1	5	2	5	2	P2	2	1	0	3	2	3	1	6	P3	1	3	1	2	1	4	2	4	P4	1	4	3	2	3	6	6	5	10	CO3
Process ID	Allocation				Max																																																												
	R1	R2	R3	R4	R1	R2	R3	R4																																																									
P0	2	0	0	1	4	2	1	2																																																									
P1	3	1	2	1	5	2	5	2																																																									
P2	2	1	0	3	2	3	1	6																																																									
P3	1	3	1	2	1	4	2	4																																																									
P4	1	4	3	2	3	6	6	5																																																									

7	a. Define swapping? Explain how swapping takes place between memory and disk storage	4	CO4	L1
	b. Explain address binding in detail	6	CO4	L2
	c. Given the order of pages 7,0,1,2,3,1,2,4,5,0,4,2,3,4,1,7,3,1,0,3,0,2,1 and if the page replacement algorithm used is optimal replacement check whether belady's anomaly exists or not considering the number of frames 3 and 4.	10	CO4	L3

OR

8	a. What is dynamic loading and dynamic linking	4	CO4	L1
	b. Explain the concept of first fit, best fit and worst fit of memory Allocation techniques with example.	6	CO4	L2
	c. Given the order of pages 5,4,2,1,3,2,4,5,1,4,6,2,1,3,1,4,5,2,1,6,5,1,5 Apply LRU, FCFS and optimal page replacement techniques and also check which algorithm suits better.	10	CO4	L3

9	a. Write a note on timer	4	CO1	L1
	b. Explain in brief system programs and its types.	6	CO1	L2
	c. List the different structures of operating system available and explain any two in detail.	10	CO1	L3

OR

10	a. Define process? What are the different attributes of a process.	4	CO2	L1
	b. Explain the concept of convey effect with an example	6	CO2	L2
	c. Consider the following set of processes with their respective arrival times and burst times. Apply Round Robin (RR) Scheduling with a time quantum of 3 and compute the following: Average Turnaround Time (TAT) Average Waiting Time (WT)	10	CO2	L3
Process ID Arrival Time Burst Time				
P1 0 4				
P2 1 7				
P3 2 5				
P4 3 9				
P5 4 6				
P6 5 8				