

Code: 23CS3401, 23IT3401

**II B.Tech - II Semester – Regular Examinations - MAY 2025****OPERATING SYSTEMS**  
**(Common for CSE, IT)****Duration: 3 hours****Max. Marks: 70**

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**Note:** 1. This question paper contains two Parts A and B.

2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.

3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.

4. All parts of Question paper must be answered in one place.

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**BL – Blooms Level****CO – Course Outcome**

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**PART – A**

		<b>BL</b>	<b>CO</b>
1.a)	Explain the role of system calls in an operating system.	L2	CO1
1.b)	Differentiate between Free and Open-Source Operating Systems.	L2	CO1
1.c)	Explain the purpose of process scheduling in an operating system.	L2	CO1
1.d)	Describe the role of multithreading in improving system performance.	L2	CO1
1.e)	Explain the critical section problem with an example.	L2	CO1
1.f)	Explain how Peterson's solution helps in solving the critical section problem.	L2	CO1
1.g)	Describe how virtual memory helps in efficient memory utilization.	L2	CO1
1.h)	Differentiate between paging and segmentation.	L2	CO1

1.i)	Describe the role of directory structures in file management.	L2	CO1
1.j)	Explain different file access methods with examples.	L2	CO1

## PART – B

			BL	CO	Max. Marks
<b>UNIT-I</b>					
2	a)	Describe various operating system services with examples.	L2	CO1	6 M
	b)	Demonstrate the role of system programs in OS functionality.	L3	CO1	4 M
<b>OR</b>					
3	a)	Compare different computing environments and their impact on OS design.	L2	CO1	5 M
	b)	Examine the significance of system calls in process management.	L4	CO1	5 M
<b>UNIT-II</b>					
4	a)	Explain different states of a process with a process state diagram.	L2	CO1	5 M
	b)	What is Round Robin Scheduling? Illustrate with an example. Can it be useful for a single user system? If yes, then explain. If no, then why not?	L3	CO2	5 M
<b>OR</b>					

5	a)	Compare preemptive and non-preemptive scheduling with examples.	L2	CO1	5 M
	b)	Compare multiple processor scheduling techniques and their impact on performance.	L4	CO4	5 M
<b>UNIT-III</b>					
6	a)	How semaphores can be used to deal with n-process critical section problem? Explain.	L3	CO2	5 M
	b)	Explain Banker's deadlock-avoidance algorithm with an illustration.	L2	CO3	5 M
<b>OR</b>					
7	a)	Explain Deadlock Detection scheme for Several Instances of a resource Type.	L3	CO3	5 M
	b)	What is semaphore? Why it is important? Suggest the solution for bounded buffer problem with semaphores.	L2	CO1	5 M
<b>UNIT-IV</b>					
8	a)	Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. Assume there are three frames. Apply LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementations of the LRU algorithm.	L3	CO3	5 M

	b)	What are the disadvantages of single contiguous memory allocation? Explain.	L2	CO1	5 M
<b>OR</b>					
9	a)	Consider a disk queue with following requests for I/O to blocks on cylinders 30,70,115,130,110,80,20,25(Assume disk head is at 90) Draw FCFS and SSTF scheduling and also determine how many times the disk head changes its direction for each of the above mentioned scheduling techniques.	L3	CO3	5 M
	b)	What is virtual memory? Discuss the benefits of virtual memory techniques.	L2	CO1	5 M
<b>UNIT-V</b>					
10	a)	Explain different File Attributes and File Operations.	L2	CO1	5 M
	b)	Explain the three allocation methods in file system implementation. Illustrate with proper diagram.	L3	CO4	5 M
<b>OR</b>					
11	a)	Explain the concept of file sharing. What are the criteria to be followed in systems which implement file sharing?	L2	CO4	5 M
	b)	Explain about domains of protection.	L2	CO1	5 M