

Question Paper consists of FIVE units, each carrying 12 marks
 Each unit has TWO questions; either of them should be answered
 All parts of a question must be answered at one place.

UNIT-I

1. a) Differentiate between multiprogramming, multitasking, multithreading, and multiprocessing. 6M
 b) Explain the services provided by an Operating System to users and system programs. 6M

(OR)

2. a) What are System Calls? Explain their role in Operating System functionality. And explain the types of System Calls with examples. 6M
 b) Discuss the structure of an Operating System. Compare monolithic and layered structures. 6M

UNIT-II

3. a)

Process	Arrival Time	Burst Time	Priority
P1	2	10	3
P2	1	5	2
P3	2	3	4
P4	5	20	1
P5	10	2	2

12M

What are the CPU scheduling criteria? Explain each criterion in detail. Calculate Average Waiting Time, Average Turnaround Time by Drawing Gantt charts illustrating the execution of these processes Using

- i) FCFS ii) SJF iii) SRT iv) Non Preemptive Priority v) Preemptive Priority
 vi) RR (Quantum=3)

(OR)

4. a) Describe the various inter-process communication (IPC) mechanisms with examples. 7M
 b) Differentiate between user-level threads and kernel-level threads. 5M

UNIT-III

5. a) Discuss Peterson's Solution for process synchronization. 5M
 b) Consider the following snapshot of the system

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	0	5	2	0
P1	1	0	0	0	1	6	5	0				
P2	1	3	5	4	1	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

7M

- i) Find whether this system is safe or not. Also find safe sequence that satisfies safety requirement.

If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately?

(OR)

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|----|----|---|----|
| 6. | a) | Differentiate between deadlock, starvation, and livelock. | 5M |
| | b) | What is Dining Philosophers problem? Discuss the solution to Dining philosopher's problem using monitors. | 7M |

UNIT-IV

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|----|----|--|----|
| 7. | a) | Compare paging, segmentation, and demand paging approaches. | 5M |
| | b) | Why disk scheduling is needed? The disk is initially at cylinder 53. Schedule the given requests with FCFS, SCAN, SSTF, LOOK algorithms. 98, 183, 37, 122, 14, 124, 65, 67, 10, 150. | 7M |

(OR)

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|----|----|--|----|
| 8. | a) | What is File System Mounting? Explain File Sharing and Protection mechanisms. | 6M |
| | b) | Compute the number page faults for FIFO, LRU, optimal page replacement strategies for the given reference string 1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2 with 4 page frames. | 6M |

UNIT-V

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| 9. | a) | Discuss the Linux File System architecture and its features. | 6M |
| | b) | Explain the Design Principles of Windows 7 Operating System. | 6M |

(OR)

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| 10. | a) | Explain how process management and file management differ in Linux and Windows systems. | 6M |
| | b) | Discuss Kernel Modules and their advantages. | 6M |