

Roll.No.

20UCSCT5006

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN  
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)  
Chromepet, Chennai - 600 044.

B.Sc.Computer Science - END SEMESTER EXAMINATIONS - NOVEMBER 2025  
SEMESTER - V

**20UCSCT5006 - Operating Systems**

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

### **Section B**

Answer any **SIX** questions ( $6 \times 5 = 30$  Marks)

1. Explain the structure and major services provided by an operating system.
2. Describe the implementation and benefits of paging for memory management in operating systems.
3. Analyze and compare FIFO and LRU page replacement algorithms in virtual memory management.
4. Apply any one file allocation method and discuss how it helps in free space management in file systems.
5. Discuss how semaphores are used to solve critical section problems in process synchronization.
6. Demonstrate, with an example, how segmentation differs from paging in memory management.
7. Illustrate the concept of demand paging and analyze its impact on system performance.
8. Evaluate and justify the importance of user authentication techniques in operating system security.

### **Section C**

Answer any **THREE** questions ( $3 \times 10 = 30$  Marks)

9. Analyze how different CPU scheduling algorithms affect system performance under various workloads. Illustrate your answer with examples.
10. Critically evaluate deadlock detection and recovery algorithms. Propose an improved solution for a given system scenario.
11. Assess advanced memory management techniques in operating systems. Justify the effectiveness of virtual memory over contiguous allocation.

**Contd...**

12. Examine the causes of thrashing in operating systems. Recommend strategies to minimize its impact, providing logical arguments.
13. Design a secure file system. Recommend authentication and protection mechanisms, and discuss their implications for system integrity.

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