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.DS - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - V
22UDSCT5005 - 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 different types of operating systems and their characteristics. Provide examples for each type.
2. Describe the structure of an operating system. Discuss how the various layers interact with each other and with the hardware.
3. Define the critical section problem and explain the strategies for solving it. What role do semaphores play in synchronization?
4. Discuss the various methods for handling deadlocks in operating systems. Include an explanation of deadlock prevention, avoidance, detection, and recovery.
5. Explain the concepts of paging and segmentation in memory management. How do they differ in terms of implementation and use?
6. What is address binding? Discuss the different methods of address binding and their impact on the execution of processes.
7. Explain the concept of thrashing in virtual memory management. What are the causes of thrashing, and how can it be mitigated?
8. Discuss the different methods of user authentication in system security. How do these methods help protect against unauthorized access?

Section C

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

9. Define a process and discuss the various states of a process in process management. How does the OS handle process scheduling?
10. Explain in detail classical problems of synchronization with example.
11. Describe the contiguous allocation method in memory management. What are its advantages and disadvantages compared to segmentation and paging?

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12. Discuss the structure of file systems, including directory and disk structure. How do allocation methods and free space management work?
13. Describe the overview of I/O systems. Discuss the role of I/O hardware and the application I/O interface in managing I/O operations.

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