II B. Tech I Semester Supplementary Examinations, July - 2023
OPERATING SYSTEMS
(Com to CSE, CST,IT,CSE(CS),CSE(IOTCSBCT), CSE(IOT),CS)

Time: 3 hours   Max. Marks: 70

Answer any **FIVE** Questions each Question from each unit
All Questions carry **Equal** Marks
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UNIT-I

1 a) What are the various components of Operating System structure? And explain simple layered approach of Operating System in detail. [7M]

   b)   i. Discuss the essential properties of Time sharing and distributed systems. [7M]
        i. What is a system call? Explain how a user application invoking the open () system call is handled.

Or

2 a)   i. With a neat diagram describe how a modern computer works? [7M]
       ii. Discuss briefly about the typical functions of an OS Kernel.

   b) What system calls have to be executed by a command interpreter or shell in order to start a new process? Discuss briefly various types of system calls. [7M]

UNIT-II

3 a) State critical section problem? Discuss three solutions to solve the critical section problem. [7M]

   b) Assume 5 processes arrived at 1, 2, 3, 4, with burst times 4, 2, 8, 6, 3. Implement preemptive scheduling algorithms and compare the performance. [7M]
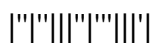
Or

4 a) What is the role of Scheduler? What requirement is to be satisfied for a solution of a critical section problem? Explain briefly. [7M]

   b) Describe various types and operations of semaphores. Give the solution for producer – consumer synchronization problem with semaphores. [7M]

UNIT-III

5 What is the need of Page Replacement? Consider the given reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. Find the number of Page Faults with FIFO, Optimal Page replacement and LRU with four, five frames which are empty initially. Which algorithm gives the minimum number of page faults? Discuss. [14M]

Or

6 a)   i. What is the need of demand paging? Explain briefly. [10M]
       ii. Explain in detail about paging technique and its implementation.

   b) Explain how protection can be ensured using paging. [4M]

UNIT-IV

7 a) Explain banker's algorithm for deadlock avoidance with an example. [7M]

   b) Compare the performance of write operations achieved by a RAID level 5 organization with that achieved by a RAID level 0 organizations? [7M]

Or

8 a) What are the objectives of file management system? Explain file system architecture. [7M]

   b) What is deadlock? Explain the conditions that lead to deadlock. Characterize it with graph. [7M]

UNIT-V

9 a) Compare and contrast the terms external and operational security in the context of operating systems. [7M]

   b) Explain the protection mechanism illustrating the use of protection domain and access control list. [7M]

Or

10 a) Explain the importance of Memory protection in multiprogramming systems. [7M]

   b) i.   Define Protection Domain with Example. [7M]
       ii. Explain about C-List with Example.

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