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| **SESSION** | **SEPTEMPER 2024** |
| **PROGRAM** | **MASTER OF COMPUTER APPLICATIONS (MCA)** |
| **SEMESTER** | **II** |
| **COURSE CODE & NAME** | **DCA6201 OPERATING SYSTEM** |
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**Set-I**

**1. Discuss the types of operating systems. Write a brief note on operating system structures**

**Ans 1.**

**Types of Operating Systems and Operating System Structures**

An operating system (OS) acts as an intermediary between users and computer hardware. It provides an environment for the execution of programs and manages system resources effectively. Different types of operating systems cater to diverse computing needs, and their structure defines how they operate internally.

**Types of Operating Systems**

**Batch Operating System** Batch operating systems group jobs with similar needs into batches and process them sequentially. Users prepare jobs and submit them to the operator, who queues them

tem for specific applications, ensuring optimal performance and resource utilization.

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**2. Discuss the CPU scheduling algorithms. Why is scheduling important?**

**Ans 2.**

**CPU Scheduling Algorithms and the Importance of Scheduling**

CPU scheduling is a fundamental aspect of operating system design, as it determines the order in which processes are executed by the CPU. Scheduling directly impacts system performance, ensuring efficient utilization of resources and improved responsiveness for users.

**CPU Scheduling Algorithms**

**First-Come, First-Served (FCFS)** FCFS is the simplest scheduling algorithm, where processes are executed in the order of their arrival. Although easy to implement, it suffers from the "convoy

**3. Discuss Interprocess Communication and critical-section problem along with use of semaphores.**

**Ans 3.**

**Interprocess Communication and the Critical-Section Problem with the Use of Semaphores**  
Interprocess communication (IPC) is a vital mechanism that allows processes to exchange data and coordinate actions in a multitasking operating system. The critical-section problem addresses ensuring data consistency when multiple processes access shared resources. Semaphores are tools that aid in solving this problem.

**Interprocess Communication**

IPC allows processes to communicate and synchronize their actions. This is essential in

**Set-II**

**4. What is a Process Control Block? What information does it hold and why? What are monitors? What is it role? 5+5**

**Ans 4.**

**Process Control Block and Monitors**

A Process Control Block (PCB) is a data structure maintained by the operating system to manage information about a process. Monitors, on the other hand, are high-level synchronization constructs that aid in managing concurrent processes.

**Process Control Block**

The PCB is essential for process management, as it stores the state and attributes of a process. It

**5. Discuss the different File Access Methods.**

**What are I/O Control Strategies?**

**Ans 5.**

**Different File Access Methods and I/O Control Strategies**

Files are fundamental components of operating systems, providing a structured way to store and retrieve data. The file access method determines how data within a file is accessed and manipulated. I/O control strategies govern the interaction between the operating system and hardware devices to ensure efficient data transfer.

**File Access Methods**

File access methods define how the operating system retrieves and processes data stored in files.

**6. Explain Paging and Segmentation along with page map table and internal external fragmentation details.**

**Ans 6.**

**Paging and Segmentation with Fragmentation Details**

Memory management is a key function of operating systems, and paging and segmentation are two methods used to allocate memory efficiently. Each approach has its advantages and challenges, particularly concerning fragmentation.

**Paging**

Paging divides physical memory into fixed-size blocks called frames and logical memory into blocks of the same size called pages. When a process needs memory, its pages are loaded into available frames, potentially in a non-contiguous manner.

**Page Map Table** The operating system maintains a page map table for each process, which maps