



# UNIT – 4

## 16 marks questions



1. **Explain the concept of a file system and its role in an operating system.**

Discuss the structure, components, and functions of a file system, including file organization, access methods, and metadata management.

2. **Compare and contrast contiguous and non-contiguous memory allocation methods.**

Discuss the advantages and disadvantages of each method, their impact on fragmentation, and the scenarios in which each is most effective.

3. **Describe different file allocation methods: contiguous, linked, and indexed allocation.**

Analyze how each method works, their respective strengths and weaknesses, and their suitability for different types of applications.

4. **Discuss the concept of RAID (Redundant Array of Independent Disks) and its levels.**

Explain the different RAID levels (RAID 0, 1, 5, 10, etc.), their characteristics, performance implications, and use cases.

5. **Explain the importance of disk scheduling algorithms.**

Discuss several disk scheduling algorithms, such as FCFS, SSTF, SCAN, and C-SCAN, including how they work and their impact on system performance.

6. **Analyze the problem of disk fragmentation and its effects on performance.**

Discuss the causes of fragmentation, how it affects read/write operations, and strategies for minimizing fragmentation, such as defragmentation.

7. **Describe the structure and purpose of the Master Boot Record (MBR) in storage management.**



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Explain the role of MBR in disk partitioning, how it operates, and the differences between MBR and GUID Partition Table (GPT).

**8. Discuss the role of metadata in file systems.**

Define metadata and explain its components, how it is used for file management, and the importance of efficient metadata handling in performance.

**9. Explain the concept of journaling in file systems and its benefits.**

Discuss how journaling works, the different journaling techniques (e.g., write-back, write-through), and how it helps in recovering from crashes.

**10. Analyze the impact of cloud storage on traditional storage management practices.**

Discuss the differences between on-premise and cloud storage solutions, their advantages, challenges, and how they affect data accessibility and security.

**11. Describe the principles and techniques of data deduplication in storage management.**

Explain how deduplication works, its advantages for storage efficiency, and the potential trade-offs in terms of performance and complexity.

**12. Discuss the challenges of storage virtualization and its benefits.**

Explain how storage virtualization works, the problems it addresses, and the advantages it offers in managing resources in dynamic environments.

**13. Explain the importance of backup and recovery strategies in storage management.**

Discuss different backup methods (full, incremental, differential), recovery point objectives (RPO), and recovery time objectives (RTO).



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**14. Describe the role of caching in storage management and its impact on performance.**

Explain how caching works, the types of cache used in storage systems, and how it helps reduce latency and improve throughput.

**15. Analyze the security challenges in storage management and propose solutions.**

Discuss common security issues (data breaches, unauthorized access) in storage systems and how techniques like encryption, access controls, and data masking can mitigate these risks.