# Grouped Operating System Questions by Topic

## 1. Memory Management

- Explain paging in detail. How logical address is converted to physical? (May 24, May 23)
- Virtual memory: segmentation with example. (May 23)
- Explain Direct Memory Access (DMA). (May 23)
- List and explain any one page replacement algorithm with example. (Dec 23)
- FIFO, LRU, Optimal - calculate page faults. (May 24, May 23)
- What is demand paging? Advantages & hardware support. (May 24, May 23)
- Explain internal fragmentation with example. (Dec 22, May 24)
- Memory allocation methods: static partition. (May 24)
- Memory fragmentation. (Dec 22)

## 2. Process Management

- Define process. Explain Process Control Block (PCB). (Dec 23, May 23)
- Differentiate between process and threads. (May 24)
- What is a thread? Benefits of multithreading. (May 24)
- Compare user-level and kernel-level threads. (Dec 23)
- Types of scheduling algorithms, explain one with example. (Dec 23)
- Gantt chart + average waiting/turnaround time: FCFS, SJF, RR, Priority (May 24, May 23)
- Compare process scheduling and process switching. (All years)

## 3. Deadlock

- Necessary conditions, deadlock detection algorithm. (May 24, May 23)
- Resource Allocation Graph explanation. (May 24)
- Deadlock recovery/avoidance. (Dec 23, May 23)

## 4. File Management

- File allocation techniques - with diagram. (Dec 22, May 24)

- Implementation of file allocation. (Dec 22)

**5. Synchronization & IPC**

- IPC (Interprocess Communication). (Dec 22)

- Semaphore: significance, types, and usage in Dining Philosophers. (Dec 23, May 23, May 24)

- Race condition with example. (May 24)

- Critical region & deadlock conditions. (Dec 23)

**6. Operating System Concepts**

- What is OS? Structure, objectives, and functions. (Dec 23, May 24)

- Characteristics of modern OS, Network OS. (Dec 23)

- UNIX OS Kernel. (May 23)

- Real-Time OS and Android. (Dec 23, May 23, May 24)

- Cloud OS: features, advantages/disadvantages. (May 23)

- Open-source OS and mobile OS design issues. (May 24)

**7. Storage & Disk**

- RAID and levels. (Dec 23, May 23, May 24)

- Disk scheduling algorithms. (May 23)