

Question Bank for

Operating Systems (16MCA24)

Module 1:

1. Briefly explain basic elements of computer components. (06)
2. Discuss different types of operating system. (08)
3. Discuss memory hierarchy concept, explaining the characteristics which distinguishes various elements. (06)
4. Classify processor registers. Explain them briefly. (10)
5. With a neat diagram, explain different stages of instruction execution. (05)
6. Discuss different types of I/O communication techniques. (06)
7. Define OS. Explain various types of services provided by OS. (08)
8. With a neat diagram, explain UNIX O S. (06)
9. With a neat diagram, explain MS-DOS layer structure. (06)
10. Write a short note on: (05m each)
 - a. System Program
 - b. Cache Memory
 - c. Multiprocessor system
 - d. Distributed System
 - e. Microkernels
 - f. Real time systems
11. What is layered approach? Explain with neat diagram and its advantages. (06)
12. Define system call. Explain different types of system calls. (06)
13. What is the need for an interrupt? Explain with an instruction cycle diagram. (06)
14. Explain various steps in interrupt processing. (05)

Module 2:

1. Differentiate process and threads. (06)
2. Discuss SMP architecture. (10)
3. Explain the five state process model with queuing diagram, showing how to change process model for a suspend process. (10)
4. Explain execution of OS with a neat diagram. (08)
5. Define process. With a neat diagram, explain different states of a process. (05)
6. Explain different levels of threads with advantages and disadvantages. (07)
7. Problems on scheduling algorithms.
8. Explain three classic problems of synchronization (08)
9. What is a semaphore? Define wait and signal operations. Explain the usage of semaphores. (10)
10. What is a monitor? With a neat diagram, explain the working of monitor. (10)
11. What do you mean by a critical section? What are the requirements of a solution to the critical section problem? Mention. (05)
12. Explain the solution of readers-writers problem using semaphores. (06)
13. How message passing is done in process synchronization? Explain. (08)
14. Discuss different types of hardware support to solve mutual exclusion. (08)
15. Discuss different concerns on security issues. (08)

Module 3:

1. What is a deadlock? What are the necessary conditions for deadlock? (04)
2. Discuss resource-allocation graph with example (06)
3. Explain Banker's algorithm with suitable example (10)
4. Explain deadlock detection algorithm for single instance and several instances of a resource type. (10)
5. What are data structures involved in Banker's algorithm? Write an algorithm to know whether the system is in safe state or not. (10)
6. Compare resource allocation graph and wait for graph with suitable examples. (06)
7. What do you mean by a critical section? What are the requirements of a solution to the critical section problem? Mention. (05)
8. Discuss different options to recover from deadlock. (06)
9. Explain Dining Philosopher's problem. (08)
10. Explain memory allocation issues with first fit, best fit and worst fit methods (06)
11. Write a note on inverted page tables (06)
12. With a neat diagram, explain paging hardware with TLB. (08)
13. Explain paging with a neat diagram. (08)
14. Explain hierarchical page table. (06)
15. Differentiate logical v/s physical address space. (04)
16. Differentiate internal and external fragmentation. (05)
17. Briefly explain the concept of segmentation. (05)
18. Explain the concepts of contiguous memory allocation. (10)
19. With a neat diagram, explain the steps involved in handling of page fault. (08)
20. Write a short note on thrashing. (06)
21. Problems on page-fault algorithms.

Module 4:

1. What is a file? What are different file attributes? (10)
2. Explain rotation latency and seek time. (06)
3. Discuss contiguous, indexed and linked allocation. (06)
4. Discuss on (i)File attributes (ii) Access Methods (iii)File Operations (10)
5. What is access matrix? Discuss its implementation (10)
6. Explain the following with respect to file system: (i) Contiguous allocation (ii) Linked Allocation (iii) Indexed allocation (12)
7. Explain file allocation methods with their merits and demerits. (08)
8. Discuss directory structure in brief. (06)
9. For the following process request of tracks, draw charts and count head movements for FCFS, SSTF, SCAN SEEK (12)
10. Explain different allocation methods. (08)
11. Write and explain two-level directory structure. (04)
12. Write a short note on free space management. (04)
13. Define disk scheduling. What are disk scheduling methods available? Explain any four in detail with example. (12)

14. Write a short note on
- (i) fork() and exec() process model (05 each)
 - (ii) seek time and rotational latency
 - (iii) Belady's anomaly
 - (iv) File system mounting
 - (v) Boot Block
 - (vi) Bad Block
15. Explain different file directory structures, with a neat diagram. (10)
16. What is meant by denial of service? Explain. (05)
17. Problems on disk scheduling (10)

Module 5:

1. Discuss various levels of security measures.
2. Write short notes on
 - (i) program threats (6)
 - (ii) system threats.
3. What are the components of Linux OS? Explain with a neat diagram (10)
4. Explain the concepts of memory management in Linux.
5. Explain Process management in Linux OS
6. Explain Inter-process communication in Linux