1. **What is the primary function of an operating system?** A) To manage hardware  
   B) To run applications  
   C) To provide user interface  
   D) All of the above
2. **Which of the following is not a process state?** A) Running  
   B) Waiting  
   C) Ready  
   D) Stopping
3. **What does CPU scheduling primarily aim to achieve?** A) Minimize memory usage  
   B) Maximize throughput  
   C) Increase disk I/O  
   D) Enhance security
4. **In multithreading, what is a thread?** A) A single sequence of control  
   B) A process  
   C) A resource allocation  
   D) A type of memory
5. **What is the main advantage of multithreading?** A) Increased memory usage  
   B) Improved CPU utilization  
   C) Simplified programming  
   D) Better security

**Medium Questions**

1. **Which scheduling algorithm is designed to minimize wait time?** A) Round Robin  
   B) First-Come, First-Served (FCFS)  
   C) Shortest Job Next (SJN)  
   D) Priority Scheduling
2. **What is the purpose of the memory management unit (MMU)?** A) To manage I/O operations  
   B) To translate virtual addresses to physical addresses  
   C) To schedule processes  
   D) To provide user interfaces
3. **What is virtual memory?** A) A type of RAM  
   B) A memory allocation technique  
   C) A method for increasing physical memory size  
   D) A technique to run multiple OS instances
4. **Which file system is primarily used by Windows operating systems?** A) ext4  
   B) NTFS  
   C) HFS+  
   D) FAT32
5. **Which of the following is an example of a concurrency issue?** A) Deadlock  
   B) Buffer overflow  
   C) Starvation  
   D) Both A and C

**Complex Questions**

1. **In a multilevel queue scheduling algorithm, what is the main disadvantage?** A) It is complex to implement  
   B) Starvation of lower-priority processes  
   C) High overhead  
   D) Requires more memory
2. **What is the principle of locality in memory management?** A) Processes need only a small amount of memory  
   B) Memory accesses are clustered in time and space  
   C) All data must be contiguous in memory  
   D) Memory must be deallocated after use
3. **Which synchronization mechanism uses a lock to manage access to a resource?** A) Semaphore  
   B) Mutex  
   C) Monitor  
   D) Barrier
4. **What is the primary purpose of a page replacement algorithm?** A) To minimize CPU usage  
   B) To manage the allocation of cache memory  
   C) To decide which memory pages to swap out  
   D) To optimize disk I/O operations
5. **Which of the following is NOT a characteristic of an ideal operating system?** A) User-friendliness  
   B) High throughput  
   C) Low security  
   D) High efficiency
6. **What does the 'thrashing' phenomenon indicate?** A) Inefficient CPU usage  
   B) Excessive page swapping  
   C) High memory utilization  
   D) Increased disk access
7. **In which memory management technique is the physical address space divided into fixed-size blocks?** A) Paging  
   B) Segmentation  
   C) Fragmentation  
   D) Virtualization
8. **What is a critical section in concurrent programming?** A) A section of code that accesses shared resources  
   B) A part of the OS kernel  
   C) A region of memory  
   D) An I/O operation
9. **Which of the following is a method of ensuring process synchronization?** A) Thread pooling  
   B) Spinlock  
   C) Memory mapping  
   D) Load balancing
10. **What is the main goal of operating system security?** A) To prevent unauthorized access  
    B) To manage resources  
    C) To optimize performance  
    D) To ensure compatibility

21. **What type of memory allocation allows processes to grow and shrink as needed?** A) Fixed partitioning  
B) Dynamic partitioning  
C) Contiguous allocation  
D) Paging

22. **Which of the following is a technique to avoid deadlock?** A) Preemption  
B) Resource allocation graph  
C) Wait-die scheme  
D) Both A and B

23. **In the context of file systems, what does the term "inode" refer to?** A) A unique identifier for files  
B) A type of file  
C) A directory structure  
D) A block of memory

24. **What is the purpose of a system call?** A) To provide an interface between user programs and the OS  
B) To execute user-level applications  
C) To manage hardware resources  
D) To create user interfaces

25. **Which of the following scheduling algorithms can lead to starvation?** A) Round Robin  
B) First-Come, First-Served (FCFS)  
C) Shortest Job First (SJF)  
D) Priority Scheduling

26. **Which technique allows multiple processes to use the same physical memory space?** A) Virtual memory  
B) Memory-mapped files  
C) Shared memory  
D) Paging

27. **What is the primary advantage of using a layered approach in operating system design?** A) Simplicity of the kernel  
B) Modularity and easier debugging  
C) Improved performance  
D) Direct hardware access

28. **What is the role of the dispatcher in process scheduling?** A) To allocate resources  
B) To switch processes in and out of the CPU  
C) To manage memory  
D) To handle I/O operations

29. **Which of the following is a method for implementing multithreading?** A) Time-sharing  
B) Fork-Join  
C) Asynchronous I/O  
D) Both A and B

30. **Which of the following represents a security vulnerability related to operating systems?**

A) Buffer overflow  
B) File fragmentation  
C) Deadlock  
D) Thrashing

Answers :

* 1. D
  2. D
  3. B
  4. A
  5. B
  6. C
  7. B
  8. B
  9. B
  10. D
  11. B
  12. B
  13. B
  14. C
  15. C
  16. B
  17. A
  18. A
  19. B
  20. A

21. B

22. D

23. A

24. A

25. D

26. C

1. B
2. B
3. D
4. A