Multiple Choice Questions and Answers

1. What is the primary function of an operating system?

    a) File Management

    b) Memory Management

    c) Process Management

    d) Network Management

    Answer: C

2. Which type of operating system is designed for personal computers?

    a) Real-Time OS

    b) Multiprogrammed OS

    c) Time-shared OS

    d) Single-User OS

    Answer: D

3. In a Simple Batch System, when does the next job start execution?

    a) After the completion of the previous job

    b) Immediately upon arrival

    c) After a fixed time interval

    d) When the system is idle

    Answer: A

4. What is the main advantage of a Multiprogrammed Operating System?

a) Improved CPU utilization

b) Faster response time

c) Better memory utilization

d) Enhanced I/O performance

Answer: A

5. Which scheduling algorithm is commonly used in Time-shared systems?

a) First-Come-First-Serve (FCFS)

b) Shortest Job Next (SJN)

c) Round Robin (RR)

d) Priority Scheduling

Answer: C

6. What is a Real-Time Operating System (RTOS) primarily designed for?

a) Scientific Computing

b) Business Applications

c) Time-sensitive tasks

d) Network Operations

Answer: C

7. Which component of an operating system is responsible for managing memory?

a) Kernel

b) Scheduler

c) Memory Manager

d) File System

Answer: C

8. What is the purpose of a System Call?

a) To execute a system program

b) To reuest services from the operating system

c) To launch an application

d) To manage file systems

Answer: B

9. In a distributed system, what is a major benefit of decentralization?

a) Improved Security

b) Enhanced Performance

c) Increased Scalability

d) Better Fault Tolerance

Answer: D

10. Which type of operating system is designed to manage multiple processors simultaneously?

    a) Time-shared OS

    b) Multiprogrammed OS

    c) Parallel OS

    d) Distributed OS

    Answer: C

11. What is the primary goal of a Personal Computer Operating System?

    a) Maximizing CPU utilization

    b) Providing a user-friendly interface

    c) Supporting parallel processing

    d) Ensuring real-time task execution

    Answer: B

12. What type of system has multiple independent processors working in parallel?

    a) Multiprogrammed System

    b) Time-shared System

    c) Parallel System

    d) Distributed System

    Answer: C

13. Which scheduling algorithm selects the job that has been in the system the longest?

d) Longest Job Next (LJN) Answer: B

a) Shortest Job Next (SJN) b) First-Come-First-Serve (FCFS) c) Priority Scheduling

14. In a distributed system, what is the role of the Network Operating System (NOS)?

    a) Manage network resources

    b) Allocate CPU time

    c) Handle memory management

    d) Control I/O operations

    Answer: A

15. What is the purpose of the File System component in an operating system?

    a) Manage memory allocation

    b) Organize files and directories

    c) Schedule processes

    d) Control network operations

    Answer: B

16. Which system call is used to create a new process in an operating system?

a) fork()

b) exec()

c) wait()

d) exit()

Answer: A

17. What is the primary function of the Scheduler in an operating system?

a) Manage memory allocation

b) Control I/O operations

c) Schedule processes for execution

d) Handle network management

Answer: C

18. Which type of operating system is designed for handling multiple users simultaneously?

a) Single-User OS

b) Multi-User OS

c) Real-Time OS

d) Batch OS

Answer: B

19. In a time-shared system, what is the time uantum or time slice?

a) The total execution time of a process

b) The time between two consecutive system calls

c) The maximum time a process can hold the CPU

d) The time allocated to each process in a round-robin fashion

Answer: D

20. What is the main advantage of a Distributed Operating System?

a) Improved Security

b) Enhanced Performance

c) Increased Scalability

d) Better Fault Tolerance

Answer: C

21. Which system call is used to terminate a process in an operating system?

a) fork()

b) exec()

c) wait()

d) exit()

Answer: D

22. What is the purpose of the Command Interpreter (Shell) in an operating system?

a) Manage memory allocation

b) Interpret user commands

c) Control I/O operations

Answer: B

d) Schedule processes

23. In a Multiprogrammed System, what is the role of the Long-Term Scheduler?

a) Allocate CPU time to processes

b) Manage memory allocation

c) Schedule processes for execution

d) Load new jobs into memory

Answer: D

24. Which type of operating system is designed for embedded systems like smartphones?

a) Real-Time OS

b) Multi-User OS

c) Mobile OS

d) Batch OS

Answer: C

25. What is the purpose of the Interrupt Handler in an operating system?

a) Manage memory allocation

b) Interpret user commands

c) Handle hardware interrupts

d) Schedule processes

Answer: C

26. In a Real-Time Operating System, what is the significance of deadlines?

a) They determine the maximum CPU time for a process

b) They indicate the time of day

c) They represent the priority of a process

d) They define time limits for task completion

Answer: D

27. What is the main purpose of the Device Drivers in an operating system?

a) Interpret user commands

b) Manage memory allocation

c) Control I/O operations

d) Schedule processes

Answer: C

28. Which scheduling algorithm selects the job with the shortest expected processing time?

a) Shortest Job Next (SJN)

b) First-Come-First-Serve (FCFS)

c) Priority Scheduling

d) Shortest Remaining Time First (SRTF)

Answer: D

29. What is the role of the Dispatcher in an operating system?

a) Manage memory allocation

b) Interpret user commands

c) Schedule processes for execution

d) Switch control from one process to another

Answer: D

30. Which type of operating system is designed to minimize response time for interactive users?

a) Batch OS

b) Time-shared OS

c) Real-Time OS

d) Multi-User OS

Answer: B

31. In a Distributed System, what is a major challenge related to communication?

a) Improved Security

b) Network Congestion

c) Increased Scalability

d) Better Fault Tolerance

Answer: B

32. Which type of system allows different parts of an application to execute concurrently?

a) Multiprogrammed System

b) Time-shared System

c) Parallel System

d) Distributed System

Answer: C

33. What is the purpose of the Job Scheduler in a Batch System?

a) Manage memory allocation

b) Interpret user commands

c) Schedule processes for execution

d) Switch control between jobs

Answer: C

34. In a Real-Time Operating System, what is the significance of the clock interrupt?

a) It signals the end of a time uantum

b) It synchronizes processes

c) It triggers a context switch

d) It indicates the passage of time

Answer: D

35. Which system call is used to open a file in an operating system?

a) create()

b) open()

c) read()

d) write()

Answer: B

36. What is the purpose of the Shell in an operating system?

a) Manage memory allocation

b) Interpret user commands

c) Control I/O operations

d) Schedule processes

Answer: B

37. In a Time-shared System, how is CPU time allocated to different users?

a) Eually among all users

b) Based on their job priority

c) In proportion to their needs

d) Randomly selected users

Answer: C

38. Which type of operating system is designed for managing resources across a network?

Answer: C

a) Real-Time OS b) Multi-User OS c) Network

OS d) Batch OS

39. What is the main advantage of a Personal Computer Operating System?

a) Improved Security

b) Enhanced Performance

c) User-Friendly Interface

d) Better Fault Tolerance

Answer: C

40. What is the purpose of the Short-Term Scheduler in an operating system?

a) Manage memory allocation

b) Interpret user commands

c) Control I/O operations

d) Select processes for execution from the ready ueue

Answer: D

41. In a Multiprogrammed System, what is the role of the Medium-Term Scheduler?

a) Allocate CPU time to processes between processes Answer: B

b) Manage memory allocation c) Schedule processes for execution d) Switch control

42. Which type of operating system allows users to interact through a graphical interface?

a) Command-Line OS

b) Graphical User Interface (GUI) OS

c) Time-shared OS

d) Real-Time OS

Answer: B

43. What is the purpose of the Process Control Block (PCB) in an operating

system?

a) Manage memory allocation

b) Interpret user commands

c) Store information about a process

d) Control I/O operations

Answer: C

44. In a Distributed System, what is a potential benefit of load balancing?

a) Improved Security

Better Fault Tolerance

Answer: B

b) Enhanced Performance

c) Increased Scalability d)

45. Which type of operating system is designed for handling a single task at a time?

a) Multi-User OS

b) Batch OS

c) Single-User OS

d) Real-Time OS

Answer: C

46. What is the role of the Secondary Storage Manager in an operating system?

a) Manage memory allocation

b) Interpret user commands

c) Control I/O operations

d) Manage data on secondary storage devices

Answer: D

47. In a Time-shared System, what is a disadvantage of context switching?

a) Increased CPU utilization

b) Reduced responsiveness

c) Improved multitasking

d) Faster task execution

Answer: B

48. Which system call is used to close a file in an operating system?

a) close()

b) read()

c) write()

d) create()

Answer: A

49. What is the primary purpose of the Long-Term Scheduler in an operating system?

a) Manage memory allocation

b) Interpret user commands

c) Schedule processes for execution

d) Load new jobs into memory

Answer: D

50. In a Distributed System, what is the role of the Resource Manager?

a) Coordination of distributed resources

b) User interface management

c) Memory allocation

Answer: A

d) Task scheduling

Explanation: The Resource Manager in a Distributed System is responsible for coordinating and managing distributed resources.

51. What is a process?

a) A program in execution

b) A code snippet

c) A file in the system

d) An algorithm

Answer: a

52. Which operation creates a new process?

a) Execute

b) Fork

c) Exit

d) Wait

Answer: b

53. What does the 'exit' operation do?

a) Starts a process

b) Terminates a process

c) Suspends a process

d) Pauses a process

Answer: b

54. What is process cooperation?

a) Sharing resources among processes

b) Competition between processes

c) Process termination

d) Forking processes

Answer: a

55. What is a thread?

a) Independent program

b) A part of a process

c) Another term for a process

d) A system file

Answer: b

56. What is interprocess communication (IPC)?

a) Process termination

b) Communication between processes

c) Resource sharing

d) Process scheduling

Answer: b

57. What does a scheduling algorithm determine?

a) Number of processes

b) Execution order of processes

c) Process termination time

d) Process creation time

Answer: b

58. What is the FIFO scheduling algorithm?

a) First In First Out

b) Fast Input Fast Output

c) First Input First Output

d) Fast In Fast Out

Answer: a

59. Which scheduling algorithm minimizes the turnaround time?

a) Round Robin

b) Shortest Job Next

c) First Come First Serve

d) Priority Scheduling

Answer: b

60. What is the purpose of the 'fork' system call?

a) Create a new process

b) Terminate a process

c) Suspend a process

d) Resume a process

Answer: a

61. Which system call is used to wait for a child process to terminate?

a) pause

b) sleep

c) wait

d) stop

Answer: c

62. What does the 'exec' system call do?

a) Exit a process

b) Start a process

c) Replace the current process image

d) Fork a process

Answer: c

63. What is a critical section?

a) Section of code that must be executed atomically

b) Section of code with a high priority

c) Section of code that forks a process

d) Section of code that exits a process

Answer: a

64. What is mutual exclusion?

a) Processes sharing resources

b) Processes competing for resources

c) Processes avoiding resources

d) Processes accessing resources simultaneously

Answer: d

65. What is deadlock?

a) Processes terminating

b) Processes waiting for each other

c) Processes competing for a resource

d) Processes cooperating

Answer: b

66. What is a semaphore?

a) A process

b) A variable for synchronization

c) A thread

d) A resource

Answer: b

67. What does the term 'starvation' mean in the context of scheduling?

a) Process termination

b) Process competition

c) Process waiting indefinitely

d) Process cooperation

Answer: c

68. What is the goal of a scheduling algorithm?

a) Maximize CPU utilization

b) Minimize turnaround time

c) Maximize throughput

d) All of the above

Answer: d

69. Which scheduling algorithm is preemptive?

a) FCFS

b) Round Robin

c) Priority Scheduling

d) SJN

Answer: b

70. What is the purpose of the 'waitpid' system call?

a) Suspend a process

b) Wait for a specific child process

c) Exit a process

d) Fork a process

Answer: b

71. What is the 'nice' value in the context of scheduling?

a) A polite process

b) Priority value for a process

c) Exit value for a process

d) A process that cooperates

Answer: b

72. What is context switching?

a) Switching between processes

b) Switching between threads

Switching between semaphores Answer: a

c) Switching between critical sections d)

73. Which scheduling algorithm considers both priority and time spent waiting?

a) Priority Scheduling

b) Round Robin

c) SJN

d) Multilevel queue Scheduling

Answer: d

74. In multiple-processor scheduling, what is load balancing?

a) Equal distribution of processes

b) Equal distribution of processors

c) Equal distribution of threads

d) Equal distribution of semaphores

Answer: a

75. What is the purpose of the 'exec' system call?

a) Exit a process

b) Start a process

c) Replace the current process image

d) Fork a process

Answer: c

76. Which scheduling algorithm is not suitable for time-sharing systems?

a) FCFS

b) Priority Scheduling

c) Round Robin

d) SJN

Answer: a

77. What is a zombie process?

a) A terminated process

b) A process with high priority

c) A process in a critical section

d) A process waiting for a resource

Answer: a

78. What is the purpose of the 'nice' system call?

a) Adjust process priority

b) Adjust process termination time

c) Adjust process creation time

d) Adjust process execution time

Answer: a

79. Which IPC mechanism is most suitable for communication between unrelated processes?

a) Pipes

b) Shared memory

c) Message passing

d) Semaphores

Answer: c

80. What does the 'pthread_create' function do?

a) Create a process

b) Create a thread

c) Create a semaphore

d) Create a message passing mechanism

Answer: b

81. What is a race condition?

a) Competition between processes

b) Competition between threads

c) Cooperation between processes

d) Cooperation between threads

Answer: b

82. What is the purpose of the 'yield' system call?

a) Terminate a process

b) Suspend a process

c) Pause a process

d) Give up the CPU voluntarily

Answer: d

83. In a round-robin scheduling, what is the time uantum?

a) Time for process execution

b) Time for process creation

c) Time for process termination

d) Time for process suspension

Answer: a

84. Which algorithm provides fairness in scheduling for both I/O-bound and CPU bound processes?

a) FCFS

b) Priority Scheduling

c) Round Robin

d) SJN

Answer: c

85. What is the primary disadvantage of the FCFS scheduling algorithm?

a) High turnaround time

b) Low CPU utilization

c) Poor throughput

d) All of the above

Answer: d

86. What is a thread pool?

a) A group of related processes

b) A pool of threads waiting for execution

c) A group of semaphores

d) A pool of messages

Answer: b

87. Which IPC mechanism is used for communication between related processes?

a) Pipes

b) Shared memory

c) Message passing

d) Semaphores

Answer: b

88. What is the purpose of the 'pthread_join' function?

a) Suspend a thread

b) Join two threads

c) Terminate a thread

d) Wait for a thread to terminate

Answer: d

89. What is the advantage of using threads over processes?

a) Threads are faster

b) Threads share resources

c) Threads have independent memory

d) Threads don't need synchronization

Answer: b

90. What is a condition variable in thread synchronization?

a) Variable indicating thread priority

b) Variable indicating thread termination

c) Variable for signaling between threads

d) Variable for thread creation

Answer: c

91. What is the purpose of the 'pthread_mutex_lock' function?

a) Unlock a mutex

b) Lock a mutex

c) Terminate a mutex

d) Suspend a mutex

Answer: b

92. What is the purpose of the 'pthread_cond_wait' function?

a) Wait for thread termination

b) Wait for thread suspension

c) Wait for condition variable signal

d) Wait for thread creation

Answer: c

93. What is the main difference between preemptive and non-preemptive scheduling?

a) Preemptive allows processes to voluntarily give up the CPU

b) Preemptive allows processes to run indefinitely

c) Non-preemptive forcibly takes CPU from running processes d)

Non-preemptive doesn't forcibly take CPU from running processes

Answer: c

94. What is a multilevel feedback ueue scheduling algorithm?

a) Algorithm for priority scheduling

b) Algorithm for round-robin scheduling

c) Algorithm for FCFS scheduling

d) Algorithm for SJN scheduling

Answer: b

95. What is a thread-safe function?

a) A function that can be called by multiple threads simultaneously

b) A function that cannot be called by multiple threads

c) A function that terminates threads

d) A function that suspends threads

Answer: a

96. What is the primary advantage of using message passing for IPC?

a) Simplicity

b) Speed

c) Resource sharing

d) Independence

Answer: a

97. What is the purpose of the 'pthread_cond_signal' function?

a) Signal thread termination

b) Signal thread suspension

c) Signal condition variable

d) Signal thread creation

Answer: c

98. Which scheduling algorithm uses a time-slice for each process?

a) Priority Scheduling

b) Round Robin

c) SJN

d) FCFS

Answer: b

99. What is the purpose of the 'pthread_yield' function?

a) Yield CPU voluntarily

b) Suspend a thread

c) Terminate a thread

d) Wait for a thread to terminate

Answer: a

100. What is the role of the 'nice' value in the context of process scheduling?

a) Indicates process politeness

b) Indicates process priority

c) Indicates process termination time

d) Indicates process creation time

Answer: b

101. What is a deadlock?

a) Process termination

b) Resource allocation issue

c) CPU scheduling

d) I/O operation

Answer: B

102. Which of the following is a necessary condition for a deadlock?

a) Hold and wait

b) No preemption

c) Circular wait

d) Mutual exclusion

Answer: C

103. What is the purpose of the Banker's algorithm?

a) Deadlock prevention

b) Deadlock avoidance

c) Deadlock detection

d) Deadlock recovery

Answer: B

104. In deadlock prevention, what is the approach of ensuring that at least one resource is released before reuesting another?

a) Hold and wait

b) No preemption

c) Circular wait

d) Resource allocation graph

Answer: A

105. Which resource allocation method considers the maximum demand and the current allocation to prevent deadlock?

a) Wait-Die

b) Wound-Wait

c) Banker's algorithm

d) Resource allocation graph

Answer: C

106. What is the primary goal of deadlock avoidance?

a) To eliminate deadlocks

b) To detect deadlocks

c) To ensure a safe state

d) To preempt resources

Answer: C

107. What does the term "critical section" refer to in the context of process synchronization?

a) A section of code that should be executed atomically

b) A section with high priority

c) A section prone to deadlock

d) A section with a long execution time

Answer: A

108. Which synchronization hardware instruction is used to achieve atomicity in a critical section?

a) Test and Set

b) Load-Link/Store-Conditional

c) Compare and Swap

d) Semaphore

Answer: A

109. In the context of synchronization, what is the role of a semaphore?

a) Achieving atomicity

b) Managing deadlock

c) Counting and signaling

d) Detecting deadlocks

Answer: C

110. What is the primary purpose of the "wait" and "signal" operations in semaphore usage?

a) Deadlock detection

b) Process termination

c) Process synchronization

d) Memory allocation

Answer: C

111. Which solution to the critical section problem allows only one process at a time to enter its critical section?

a) Locks

b) Semaphores

c) Monitors

d) Barriers

Answer: B

112. What is the purpose of the "entry" and "exit" procedures in the context of monitors?

a) Achieving atomicity

b) Deadlock detection

c) Process synchronization

d) Resource allocation

Answer: C

113. What is the primary concern addressed by the Dining Philosophers problem?

a) Deadlock

b) Starvation

c) Process synchronization

d) Mutual exclusion

Answer: B

114. Which synchronization problem involves processes waiting indefinitely for an event that can never occur?

a) Livelock

b) Deadlock

c) Starvation

d) Race condition

Answer: A

115. Which algorithm prevents multiple processes from entering the critical section simultaneously?

a) Peterson's algorithm

b) Dekker's algorithm

c) Lamport's bakery algorithm

d) Fischer's algorithm

Answer: C

116. What is the primary role of a mutex in synchronization?

a) To prevent deadlock

b) To manage process priority

c) To achieve mutual exclusion

d) To detect livelock

Answer: C

117. Which synchronization problem involves processes waiting for an event that has already occurred?

a) Deadlock

b) Starvation

c) Race condition

d) Missed wakeup

Answer: D

118. What is the purpose of the "signal and wait" mechanism in process synchronization?

a) Achieving atomicity

b) Preventing deadlock

c) Avoiding race conditions

d) Coordinating process execution

Answer: D

119. Which synchronization problem occurs when two or more processes are unable to proceed because each is waiting for the other to release a resource?

a) Deadlock

b) Starvation

c) Race condition

d) Priority inversion

Answer: A

120. In the context of synchronization, what does the term "race condition" refer to?

a) Waiting indefinitely for an event

b) Unintended concurrent access to shared data

c) Processes unable to proceed

d) Simultaneous execution of multiple processes

Answer: B

121. Which algorithm prevents deadlock by allowing processes to preemptively release resources and restart?

a) Banker's algorithm

b) Wait-Die

c) Wound-Wait

d) Resource allocation graph

Answer: B

122. What is the primary purpose of the Resource Allocation Graph in deadlock detection?

a) To prevent deadlock

b) To detect deadlock

c) To avoid deadlock

d) To recover from deadlock

Answer: B

123. Which synchronization primitive is used to guard access to a critical section in a multithreaded environment?

a) Mutex

b) Semaphore

c) Barrier

d) Monitor

Answer: A

124. What is the term for the situation where a high-priority process is waiting for a resource held by a low-priority process?

a) Priority inversion

b) Priority scheduling

c) Priority aging

d) Priority inheritance

Answer: A

125. Which synchronization problem involves processes waiting indefinitely due to a circular waiting pattern?

a) Livelock

b) Deadlock

c) Starvation

d) Priority inversion

Answer: B