Short Questions

1. Define circular wait in the context of deadlock.

2. How does a resource allocation graph represent deadlock?

3. Explain the role of no preemption in deadlock conditions.

4. What is the purpose of mutual exclusion in deadlock conditions?

5. How does deadlock avoidance differ from deadlock prevention?

6. Name a disadvantage of using busy waiting in synchronization.

7. Explain the concept of a bounded buffer in synchronization.

8. What is a binary semaphore?

9. How does a monitor simplify synchronization compared to semaphores?

10. What is a race condition in the context of synchronization?

11. How does deadlock detection work in distributed systems?

12. Explain the concept of a semaphore count in synchronization.

13. Why is circular wait considered a dangerous condition in deadlock?

14. What is the significance of atomicity in the critical section problem?

15. How does starvation differ from deadlock?

16. What is the purpose of synchronization primitives in concurrent programming?

17. Why is deadlock recovery a complex process?

18. How does a semaphore differ from a mutex?

19. What is the role of a condition variable in synchronization?

20. Explain the concept of a critical region in the context of process synchronization.

21. How does IPC using message passing differ from shared memory?

22. Name a disadvantage of using busy waiting in synchronization.

23. What is the purpose of the 'wait' and 'signal' operations in synchronization?

24. How does deadlock avoidance differ from deadlock detection?

25. Explain the role of a turn variable in the context of synchronization.

26. What is memory management?

27. Define Logical Address Space.

28. What is Physical Address Space?

29. Explain the concept of Swapping.

30. What is Contiguous Allocation?

31. Define Paging.

32. What is Segmentation?

33. Explain Segmentation with Paging.

34. Define Demand Paging.

35. What are Page Replacement Algorithms?

36. Name a common Page Replacement Algorithm.

37. Explain the FIFO (First-In-First-Out) Page Replacement Algorithm.

38. What is the purpose of the Clock Page Replacement Algorithm?

39. Define Thrashing in the context of memory management.

40. What is a Page Table?

41. Explain the concept of Inverted Page Table.

42. What is the role of the Translation Lookaside Buffer (TLB) in memory management?

43. Define Memory-Mapped File.

44. What is a Dirty Bit in the context of page tables?

45. Explain the Two-Step Process of Address Translation in a Paging System.

46. Define Memory Fragmentation.

47. What is the purpose of the Memory Management Unit (MMU)?

48. Explain the role of the Page Fault Handler in demand paging.

49. What is the purpose of the Resident Set Size (RSS) in memory management?

50. Define Working Set in the context of demand paging.

51. What is the role of the Global Page Table in a multiprogramming environment?

52. Explain the concept of Memory Protection.

53. What is the purpose of the Relocation Register?

54. Define the term 'Page Fault.'

55. What is the difference between Internal Fragmentation and External Fragmentation?

56. Explain the concept of Memory Paging.

57. Define Swapping Overhead.

58. What is the role of the Working Set Model in demand paging?

59. Explain the Belady's Anomaly in the context of page replacement algorithms.

60. Define Multilevel Page Tables.

61. What is the role of the Shadow Page Table in virtual memory systems?

62. Explain the concept of Anticipatory Paging.

63. What is Copy-on-Write (COW) in the context of memory management?

64. Define Memory-Resident Pages.

65. Explain the concept of Page Buffering.

66. What is the role of the Dirty Page List in page replacement algorithms?

67. Define the term 'Thrashing Avoidance.'

68. Explain the concept of Page Coloring.

69. What is the purpose of the Valid-Invalid Bit in a page table entry?

70. Define Zero-Filled Pages.

71. Explain the concept of Memory-Mapped I/O.

72. What is the role of the TLB Miss Handler?

73. Define the term 'Page Fault Rate.'

74. Explain the concept of Page Coloring in the context of cache memory.

75. What is the purpose of the Modified Bit in a page table entry?

76. What is a file system interface?

77. Name two common access methods for files.

78. What is a directory structure?

79. How does protection in file systems work?

80. Define File System Structure.

81. Explain allocation methods for file storage.

82. What is free-space management in file systems?

83. Define open system call in the context of file systems.

84. How is the create system call used in file systems?

85. Explain the read system call.

86. Describe the write system call.

87. What is the purpose of the close system call?

88. Explain the lseek system call.

89. How is the stat system call used?

90. Define the ioctl system call.

91. What are the different file access permissions in Unix-like systems?

92. Explain the concept of a file descriptor.

93. What is the purpose of the umask in file systems?

94. Differentiate between absolute and relative path in file systems.

95. How is a symbolic link different from a hard link?

96. What is the purpose of the chown command in Unix-like systems?

97. Explain the concept of inodes in file systems.

98. What is the role of the mount command in file systems?

99. Describe the purpose of the fsck utility.

100. What is a superblock in the context of file systems?

101. Explain the concept of file fragmentation.

102. How does the fcntl system call work?

103. Describe the purpose of the access system call.

104. What is the purpose of the mkdir system call?

105. Explain the difference between synchronous and asynchronous I/O.

106. How is the rmdir command used in Unix-like systems?

107. What is the purpose of the unlink system call?

108. How is the statfs system call used?

109. Describe the concept of file locking.

110. Explain the purpose of the sync system call.

111. What is the purpose of the truncate system call?

112. How is the chdir system call used in file systems?

113. Explain the purpose of the link system call.

114. What is the role of the umount command in file systems?

115. How does the rename system call work?

116. Describe the purpose of the ftruncate system call.

117. What is the purpose of the lstat system call?

118. Explain the role of the opendir and readdir system calls.

119. How is the rewinddir system call used?

120. Describe the purpose of the telldir system call.

121. How does the chroot system call work?

122. What is the purpose of the readlink system call?

123. Explain the concept of file system journaling.

124. How is the access time of a file updated in Unix-like systems?

125. Describe the purpose of the flock system call.