Memory Management

1-50

1. Which of the following is not a memory management scheme?
   a) Paging
   b) Segmentation
   c) Contiguous allocation
   d) Defragmentation
   Answer: d

2. In a paging system, the page size is defined by:
   a) User
   b) Compiler
   c) Operating System
   d) Application Program
   Answer: c

3. What is the role of the Memory Management Unit (MMU)?
   a) Handles memory allocation
   b) Manages the cache memory
   c) Translates virtual addresses to physical addresses
   d) Manages the CPU registers
   Answer: c

4. A technique used to move pages between main memory and a secondary storage to provide a large logical memory space is:
   a) Paging
   b) Segmentation
   c) Swapping
   d) Thrashing
   Answer: c

5. The time taken to move the disk arm to the desired cylinder is called:
   a) Seek Time
   b) Latency Time
   c) Access Time
   d) Transfer Time
   Answer: a

6. Which memory allocation scheme uses fixed-sized blocks?
   a) Paging
   b) Segmentation
   c) Variable-partitioning
   d) Fixed-partitioning
   Answer: a

7. The process of mapping a logical address to a physical address is known as:

a) Binding
b) Linking
c) Loading
d) Parsing
Answer: a

8. In which type of fragmentation does memory get wasted within allocated memory blocks?
a) External Fragmentation
b) Internal Fragmentation
c) Contiguous Fragmentation
d) None of the above
Answer: b

9. Which replacement policy replaces the page that has not been used for the longest period of time?
a) FIFO
b) LRU
c) Optimal
d) Clock
Answer: b

10. Thrashing is caused by:
a) Too many programs running simultaneously
b) High degree of multiprogramming
c) Low CPU utilization
d) All of the above
Answer: d

11. In paging, the size of a page table is dependent on:
a) Number of pages
b) Number of frames
c) Size of pages
d) Number of processes
Answer: a

12. The algorithm used for memory compaction is:
a) Best-fit
b) First-fit
c) Buddy system
d) Worst-fit
Answer: c

13. When a process is in memory, its segments are loaded into:
a) Contiguous blocks
b) Non-contiguous blocks
c) Fixed-size partitions
d) Variable-size partitions
Answer: b

14. A page fault occurs when:
a) A page is found in the memory
b) A page is not found in the memory
c) A page is corrupted
d) A page is read-only
Answer: b

15. The primary advantage of segmented memory management is:
a) Simplified memory allocation
b) Efficient use of memory
c) Improved security and protection
d) Faster access time
Answer: c

16. What does TLB stand for?
a) Translation Lookaside Buffer
b) Temporary Load Buffer
c) Transfer Line Buffer
d) Translation Load Buffer
Answer: a

17. Which of the following best describes "demand paging"?
a) Pages are loaded into memory at the start of a process
b) Pages are loaded only when they are needed
c) All pages of a process are preloaded
d) Pages are periodically swapped in and out
Answer: b

18. In the context of memory management, the term "swapping" refers to:
a) Exchanging the contents of two pages
b) Moving processes between main memory and disk
c) Reallocating memory from one process to another
d) Sharing memory between processes
Answer: b

19. The primary disadvantage of the FIFO page replacement algorithm is:
a) Complexity
b) Anomaly behavior
c) Slow execution
d) High overhead
Answer: b

20. Which memory allocation strategy suffers from external fragmentation?
a) Fixed partitioning
b) Paging
c) Segmentation
d) Variable partitioning
Answer: d

21. The term "virtual memory" refers to:
a) Memory on secondary storage
b) The addressable memory space
c) The RAM installed in the computer
d) A combination of RAM and disk space
Answer: d

22. Which hardware mechanism is essential for implementing virtual memory?
a) Cache memory
b) TLB
c) MMU
d) DMA
Answer: c

23. The optimal page replacement algorithm is:
a) Implemented in hardware
b) Theoretically the best
c) Least recently used
d) First-in, first-out
Answer: b

24. Which one is not a state in process life cycle?
a) Ready
b) Waiting
c) Blocked
d) Running
Answer: c

25. The main purpose of the memory hierarchy is to:
a) Provide the fastest possible access to data
b) Increase the size of memory available
c) Provide redundant copies of data
d) Reduce the cost of memory
Answer: a

26. Page tables are stored in:
a) Main memory
b) Cache
c) Registers
d) Disk
Answer: a

27. Which of the following is used to prevent thrashing?
a) Increase the degree of multiprogramming
b) Reduce the degree of multiprogramming
c) Use larger pages
d) Use smaller pages
Answer: b

28. A page table entry in a pure paging system contains:
a) Page number
b) Frame number
c) Disk address
d) Logical address
Answer: b

29. The "working set" model is used for:
a) Memory allocation
b) Page replacement
c) Process scheduling
d) Disk scheduling
Answer: b

30. What does the term "dirty bit" signify in the context of memory pages?
a) The page is read-only
b) The page has been modified
c) The page is locked
d) The page is shared
Answer: b

31. Which memory management scheme permits the physical address space of a process to be non-contiguous?
a) Paging
b) Contiguous allocation
c) Fixed partitioning
d) Dynamic partitioning
Answer: a

32. Which of the following is true for segmentation?
a) Segments have fixed size
b) Segments can vary in size
c) Segments are implemented in hardware
d) Segments do not support sharing
Answer: b

33. When a process references a page that is not in memory, it results in:
a) Segmentation fault
b) Page fault
c) Stack overflow
d) Memory leak
Answer: b

34. Belady's anomaly is associated with which page replacement algorithm?
a) FIFO
b) LRU
c) LFU
d) Optimal

Answer: a

35. The primary goal of memory management is to:
a) Maximize CPU usage
b) Maximize disk usage
c) Maximize the utilization of memory
d) Minimize response time
Answer: c

36. The concept of "paging" involves:
a) Dividing a process into equal-sized pages
b) Dividing memory into fixed-size blocks
c) Both a and b
d) Neither a nor b
Answer: c

37. In a paging system, what does the term "page frame" refer to?
a) A section of the virtual address space
b) A section of the physical memory
c) A segment of the process code
d) A disk block
Answer: b

38. Which of the following statements about the "best-fit" memory allocation strategy is true?
a) It always provides the smallest leftover hole
b) It is faster than first-fit
c) It always leads to more fragmentation
d) It is less efficient than worst-fit
Answer: a

39. Which of the following algorithms requires knowledge of the future?
a) LRU
b) FIFO
c) Optimal
d) Clock
Answer: c

40. Which memory management technique has the problem of suffering from internal fragmentation?
a) Segmentation
b) Paging
c) Fixed partitioning
d) Dynamic partitioning
Answer: c

41. Which type of memory allocation is associated with external fragmentation?
a) Paging
b) Segmentation

c) Variable partitioning
d) Fixed partitioning
Answer: c

42. The principle of locality of reference justifies the use of:
a) Cache memory
b) Virtual memory
c) Segmentation
d) None of the above
Answer: a

43. Which memory management technique supports multiprogramming?
a) Fixed partitioning
b) Variable partitioning
c) Paging
d) All of the above
Answer: d

44. Which of the following is not a valid page replacement policy?
a) FIFO
b) LRU
c) SSTF
d) Optimal
Answer: c

45. The inverted page table is used to:
a) Reduce the number of page tables
b) Speed up the translation process
c) Save memory
d) All of the above
Answer: d

46. The size of a process's address space is defined by:
a) Physical memory size
b) Virtual memory size
c) Number of processes
d) Process's code size
Answer: b

47. The "buddy system" is used for:
a) Allocating memory in variable-size blocks
b) Allocating memory in fixed-size blocks
c) Efficient disk scheduling
d) Process synchronization
Answer: a

48. Which page replacement algorithm is most likely to cause thrashing?
a) FIFO

b) LRU
c) LFU
d) Optimal
Answer: a

49. Which of the following memory management techniques allows for the sharing of code and data?
a) Paging
b) Segmentation
c) Both a and b
d) None of the above
Answer: c

50. The primary function of the relocation register is to:
a) Translate logical addresses to physical addresses
b) Keep track of free memory spaces
c) Store the base address of the program
d) Hold the limit of the process
Answer: a

51-100

51. Which of the following is true for demand paging?
a) All pages are loaded into memory at the start
b) Pages are loaded on demand
c) Entire process is swapped at once
d) None of the above
Answer: b

52. Page replacement occurs when:
a) A page is modified
b) A page is read from disk
c) A new page is needed but no free frames are available
d) All of the above
Answer: c

53. The term "soft page fault" refers to:
a) A page fault handled without accessing the disk
b) A page fault that requires disk access
c) A page fault that cannot be resolved
d) None of the above
Answer: a

54. Which scheduling algorithm can lead to starvation?
a) FIFO
b) Round Robin
c) Shortest Job Next
d) None of the above

Answer: c

55. The page table base register (PTBR) is used to:
a) Store the starting address of the page table
b) Store the size of the page table
c) Keep track of the free page frames
d) Manage the cache memory
Answer: a

56. A major issue in memory management is:
a) Maximizing CPU usage
b) Minimizing disk space
c) Balancing memory usage and CPU performance
d) All of the above
Answer: d

57. The "clock" page replacement algorithm is a modification of:
a) FIFO
b) LRU
c) Optimal
d) LFU
Answer: a

58. Inverted page tables are used primarily to:
a) Decrease memory usage
b) Increase memory usage
c) Handle larger memory spaces
d) Simplify address translation
Answer: a

59. The concept of "memory hierarchy" in computer systems is primarily based on:
a) Cost and speed
b) Size and access time
c) Access time and frequency of access
d) All of the above
Answer: d

60. Which page replacement algorithm does not suffer from Belady's anomaly?
a) FIFO
b) LRU
c) Optimal
d) Clock
Answer: b

61. Which of the following terms is used to describe the concept of allocating portions of physical memory to different processes in such a way that each process can run as if it has the entire memory to itself?
a) Segmentation

b) Virtual Memory
c) Paging
d) Memory Management
Answer: b

62. The "TLB hit" ratio is:
a) The percentage of times that a page is found in the TLB
b) The percentage of times that a page is not found in the TLB
c) The percentage of times that a page fault occurs
d) None of the above
Answer: a

63. The primary purpose of segmentation is:
a) To provide more memory
b) To provide protection and sharing
c) To speed up the CPU
d) To facilitate swapping
Answer: b

64. The purpose of a memory map in a memory management system is:
a) To track free and used memory locations
b) To translate logical addresses to physical addresses
c) To prevent fragmentation
d) To speed up memory access
Answer: a

65. Which of the following is not an advantage of paging?
a) Elimination of external fragmentation
b) Ease of relocation
c) Simplicity of implementation
d) Reducing the number of page faults
Answer: d

66. When a process requests more memory than is physically available, the operating system will:
a) Increase the size of RAM
b) Use virtual memory techniques
c) Terminate the process
d) Run the process in slow mode
Answer: b

67. Which of the following is true about "page size" in a paging system?
a) Larger page sizes can reduce page table size
b) Smaller page sizes can reduce internal fragmentation
c) Both a and b
d) None of the above
Answer: c

68. A segment table entry typically contains:

a) Segment number
b) Base address and limit
c) Logical address
d) Physical address
Answer: b

69. In a virtual memory system, what is "page stealing"?
a) Taking a page frame from another process
b) Swapping a page to disk
c) Allocating a new page frame
d) None of the above
Answer: a

70. The primary disadvantage of the "best-fit" memory allocation strategy is:
a) It always leaves the smallest leftover hole
b) It is faster than first-fit
c) It tends to fragment memory
d) It is less efficient than worst-fit
Answer: c

71. Which of the following is not a characteristic of segmentation?
a) Each segment has a name and length
b) Segments are of the same size
c) Segments can be shared
d) Segments can grow or shrink independently
Answer: b

72. In memory management, a "resident set" refers to:
a) The portion of a process that is actually in physical memory
b) The entire virtual memory space of a process
c) The number of processes in the system
d) The number of page frames allocated to a process
Answer: a

73. What is the role of a "swap space" in a virtual memory system?
a) To store frequently accessed data
b) To hold pages that are swapped out of main memory
c) To manage memory allocation
d) To speed up disk access
Answer: b

74. In the context of memory management, "garbage collection" refers to:
a) Reclaiming memory that is no longer in use
b) Allocating new memory
c) Defragmenting memory
d) Swapping out pages
Answer: a

75. Which of the following is a method to handle a deadlock situation?
a) Avoidance
b) Prevention
c) Detection
d) All of the above
Answer: d

76. In a paged memory system, the "frame" is:
a) A portion of virtual memory
b) A portion of physical memory
c) A data structure used to map virtual to physical addresses
d) An entry in the page table
Answer: b

77. The "second chance" page replacement algorithm is an enhancement of:
a) FIFO
b) LRU
c) Optimal
d) LFU
Answer: a

78. In a segmented memory system, the logical address consists of:
a) Page number and offset
b) Segment number and offset
c) Frame number and offset
d) Block number and offset
Answer: b

79. Which of the following best describes "thrashing"?
a) Excessive swapping of pages in and out of memory
b) A large number of page faults
c) High CPU utilization
d) A state in which no process can progress
Answer: a

80. Which of the following page replacement algorithms suffers from the "Belady's anomaly"?
a) LRU
b) FIFO
c) Optimal
d) Second chance
Answer: b

81. In the context of operating systems, what is a "dirty page"?
a) A page that has not been accessed for a long time
b) A page that has been modified
c) A page that is being used by multiple processes
d) A page that contains executable code
Answer: b

82. The main purpose of a "page table" in a virtual memory system is to:
a) Manage the allocation of page frames
b) Translate logical addresses to physical addresses
c) Keep track of free memory
d) Store the contents of each page
Answer: b

83. Which of the following is not an example of internal fragmentation?
a) Unused memory within allocated blocks
b) Unused memory between allocated blocks
c) Memory allocated but not used by the process
d) Memory wasted due to page size
Answer: b

84. The "working set" of a process is:
a) The total set of pages that the process can access
b) The set of pages currently in physical memory
c) The set of pages the process is currently using
d) The set of pages the process will need in the future
Answer: c

85. Which of the following is true about the "least recently used (LRU)" page replacement algorithm?
a) It replaces the page that has not been used for the longest time
b) It replaces the page that will not be used for the longest time
c) It replaces the page that is least frequently used
d) It replaces the page that was brought into memory first
Answer: a

86. Which of the following is a disadvantage of the "first-fit" memory allocation strategy?
a) It is less efficient than best-fit
b) It always leaves the smallest leftover hole
c) It can lead to fragmentation
d) It is slower than worst-fit
Answer: c

87. In the context of memory management, what is "pre-paging"?
a) Loading pages before they are accessed
b) Loading pages on demand
c) Loading all pages of a process at once
d) Loading only frequently accessed pages
Answer: a

88. In a system with virtual memory, "page fault frequency" can be reduced by:
a) Increasing the page size
b) Increasing the degree of multiprogramming
c) Increasing the size of the working set
d) Decreasing the size of the working set
Answer: c

89. Which of the following best describes "virtual address space"?
a) The set of all logical addresses used by a process
b) The set of all physical addresses used by a process
c) The total amount of physical memory in the system
d) The total amount of disk space in the system
Answer: a

90. Which of the following is a dynamic storage allocation technique that attempts to minimize the amount of wasted memory?
a) First-fit
b) Best-fit
c) Worst-fit
d) Next-fit
Answer: b

91. In the context of virtual memory, what does "swapping" mean?
a) Exchanging data between cache and main memory
b) Moving entire processes between main memory and disk
c) Moving pages between main memory and disk
d) Exchanging data between registers and main memory
Answer: b

92. In a system with virtual memory, "demand paging" is a technique that:
a) Loads pages into memory on demand
b) Loads all pages of a process into memory at once
c) Loads pages into memory before they are needed
d) Keeps frequently used pages in memory
Answer: a

93. The "page fault frequency" algorithm is used to:
a) Determine the optimal page size
b) Control the rate of page faults
c) Manage the page table
d) Optimize disk access time
Answer: b

94. What is the main purpose of "memory compaction"?
a) To reduce the size of memory
b) To eliminate internal fragmentation
c) To reduce external fragmentation
d) To speed up memory access
Answer: c

95. In a paging system, the "page table" is used to:
a) Keep track of free memory
b) Translate virtual addresses to physical addresses
c) Manage the allocation of page frames
d) Store the contents of each page

Answer: b

96. Which of the following best describes the "optimal" page replacement algorithm?
a) It replaces the page that has not been used for the longest time
b) It replaces the page that will not be used for the longest time
c) It replaces the page that is least frequently used
d) It replaces the page that was brought into memory first
Answer: b

97. The "clock" page replacement algorithm is also known as:
a) FIFO
b) LRU
c) Second chance
d) Optimal
Answer: c

98. Which of the following is an advantage of using "segmentation" in memory management?
a) Simplifies memory allocation
b) Reduces the size of page tables
c) Provides protection and sharing
d) Eliminates external fragmentation
Answer: c

99. In the context of memory management, what is a "page frame"?
a) A fixed-size block of physical memory
b) A fixed-size block of virtual memory
c) A variable-size block of physical memory
d) A variable-size block of virtual memory
Answer: a

100. Which of the following is a disadvantage of "fixed partitioning" in memory management?
a) External fragmentation
b) Internal fragmentation
c) Complexity of implementation
d) High overhead
Answer: b

101-150

101. Which of the following algorithms uses a circular buffer to track pages?
a) FIFO
b) LRU
c) Clock
d) Optimal
Answer: c

102. The "LRU-K" page replacement algorithm extends the LRU algorithm by considering:
a) The last K references of each page

b) The first K references of each page
c) The number of times a page has been referenced
d) The age of each page
Answer: a

103. In the context of page replacement, the "aging" algorithm simulates:
a) FIFO
b) LRU
c) LFU
d) Optimal
Answer: b

104. The main advantage of "dynamic partitioning" over "fixed partitioning" is:
a) Simplicity
b) Flexibility
c) Speed
d) Cost
Answer: b

105. The purpose of a "reference bit" in a page table entry is to:
a) Indicate if the page is modified
b) Track if the page is recently accessed
c) Indicate if the page is in memory
d) Store the frame number
Answer: b

106. Which memory management technique divides programs into variable-size segments?
a) Paging
b) Segmentation
c) Fixed partitioning
d) Dynamic partitioning
Answer: b

107. In a virtual memory system, what is the "resident set size"?
a) The total number of pages in virtual memory
b) The number of pages currently in physical memory
c) The maximum number of pages that can be in memory
d) The number of pages in secondary storage
Answer: b

108. The "Buddy system" is a memory allocation technique that:
a) Allocates memory in powers of two
b) Allocates memory in variable-size blocks
c) Allocates memory in fixed-size blocks
d) Allocates memory based on process size
Answer: a

109. What is the "hit ratio" in the context of cache memory?

a) The percentage of accesses found in the cache
b) The percentage of accesses not found in the cache
c) The time taken to access data in the cache
d) The size of the cache memory
Answer: a

110. In a demand paging system, a "page fault" occurs when:
a) A page is not found in memory
b) A page is modified
c) A page is read-only
d) A page is in memory
Answer: a

111. The primary purpose of the "page replacement" algorithm is to:
a) Minimize the number of page faults
b) Maximize the number of page faults
c) Increase CPU utilization
d) Decrease CPU utilization
Answer: a

112. Which of the following is true about "global" page replacement?
a) Pages are replaced from the process's own set
b) Pages can be replaced from any process
c) Pages are replaced from the system cache
d) Pages cannot be replaced
Answer: b

113. In the context of memory management, "internal fragmentation" refers to:
a) Wasted space within allocated memory blocks
b) Wasted space between allocated memory blocks
c) Wasted space in the page table
d) Wasted space in the swap area
Answer: a

114. The "not recently used (NRU)" page replacement algorithm uses which of the following bits?
a) Reference bit and modified bit
b) Reference bit only
c) Modified bit only
d) Present bit and modified bit
Answer: a

115. Which of the following is an example of "preemptive" scheduling?
a) Shortest Job Next
b) Round Robin
c) First Come First Serve
d) Priority Scheduling
Answer: b

116. In a paged memory system, a "frame" is:
a) A portion of virtual memory
b) A portion of physical memory
c) A data structure used to map virtual to physical addresses
d) An entry in the page table
Answer: b

117. The "Optimal" page replacement algorithm is also known as:
a) Belady's algorithm
b) LRU algorithm
c) Clock algorithm
d) LFU algorithm
Answer: a

118. Which of the following is a disadvantage of the "best-fit" memory allocation strategy?
a) It always leaves the largest leftover hole
b) It is faster than first-fit
c) It tends to fragment memory
d) It is less efficient than worst-fit
Answer: c

119. Which of the following best describes "external fragmentation"?
a) Wasted space within allocated memory blocks
b) Wasted space between allocated memory blocks
c) Wasted space in the page table
d) Wasted space in the swap area
Answer: b

120. The "resident set management" in a virtual memory system refers to:
a) The total set of pages that the process can access
b) The set of pages currently in physical memory
c) The set of pages the process is currently using
d) The set of pages the process will need in the future
Answer: b

121. In the context of memory management, what is "page sharing"?
a) Multiple processes using the same physical page
b) Multiple processes using different physical pages
c) A single process using multiple pages
d) None of the above
Answer: a

122. The "thrashing" in a virtual memory system is primarily caused by:
a) High CPU utilization
b) High disk utilization
c) Low CPU utilization
d) Low disk utilization
Answer: b

123. Which of the following is true about "local" page replacement?
a) Pages are replaced from the process's own set
b) Pages can be replaced from any process
c) Pages are replaced from the system cache
d) Pages cannot be replaced
Answer: a

124. The main disadvantage of "dynamic partitioning" in memory management is:
a) External fragmentation
b) Internal fragmentation
c) Complexity of implementation
d) High overhead
Answer: a

125. In a virtual memory system, the "working set" model is used to:
a) Keep frequently used pages in memory
b) Load pages on demand
c) Determine the optimal page size
d) Optimize disk access time
Answer: a

126. The "translation lookaside buffer (TLB)" is used to:
a) Speed up the translation of virtual addresses to physical addresses
b) Speed up the translation of physical addresses to virtual addresses
c) Manage the page table
d) Manage the cache memory
Answer: a

127. Which of the following is an example of a "non-preemptive" scheduling algorithm?
a) Round Robin
b) Shortest Job Next
c) Priority Scheduling
d) Multilevel Queue Scheduling
Answer: b

128. The main purpose of a "page fault handler" is to:
a) Handle page faults
b) Manage the page table
c) Allocate page frames
d) Optimize disk access time
Answer: a

129. The "aging" algorithm in page replacement uses:
a) A counter to keep track of the age of each page
b) A bit vector to keep track of page references
c) A FIFO queue to manage pages
d) An LRU stack to manage pages
Answer: a

130. Which of the following best describes the "Buddy system" memory allocation technique?
a) Allocates memory in fixed-size blocks
b) Allocates memory in variable-size blocks
c) Allocates memory in powers of two
d) Allocates memory based on process size
Answer: c

131. The main advantage of using "paging" in memory management is:
a) Eliminates internal fragmentation
b) Eliminates external fragmentation
c) Simplifies memory allocation
d) Provides protection and sharing
Answer: b

132. In the context of memory management, what is a "page table entry (PTE)"?
a) An entry in the page table that maps a virtual page to a physical frame
b) An entry in the page table that stores the contents of a page
c) An entry in the page table that keeps track of free memory
d) An entry in the page table that manages page faults
Answer: a

133. The "clock" page replacement algorithm is an approximation of:
a) FIFO
b) LRU
c) Optimal
d) LFU
Answer: b

134. In a segmented memory system, the "base register" is used to:
a) Store the starting address of a segment
b) Store the size of a segment
c) Keep track of the free segments
d) Manage the segment table
Answer: a

135. The "FIFO" page replacement algorithm is:
a) Simple to implement
b) Complex to implement
c) The most efficient
d) The least efficient
Answer: a

136. In a paged memory system, the "page frame number (PFN)" is:
a) A portion of virtual memory
b) A portion of physical memory
c) A data structure used to map virtual to physical addresses
d) An entry in the page table
Answer: b

137. The "dirty bit" in a page table entry is used to indicate:
a) If the page has been modified
b) If the page is in memory
c) If the page is read-only
d) If the page is shared
Answer: a

138. The main disadvantage of the "worst-fit" memory allocation strategy is:
a) It always leaves the largest leftover hole
b) It is faster than first-fit
c) It tends to fragment memory
d) It is less efficient than best-fit
Answer: c

139. The "page fault rate" in a virtual memory system can be minimized by:
a) Increasing the size of the working set
b) Decreasing the size of the working set
c) Increasing the page size
d) Decreasing the page size
Answer: a

140. The "TLB miss" ratio is:
a) The percentage of times that a page is found in the TLB
b) The percentage of times that a page is not found in the TLB
c) The percentage of times that a page fault occurs
d) The percentage of times that a page is found in the page table
Answer: b

141. The primary purpose of the "memory management unit (MMU)" is to:
a) Manage the memory allocation
b) Manage the virtual memory system
c) Manage the page table
d) Translate virtual addresses to physical addresses
Answer: d

142. In a segmented memory system, the "limit register" is used to:
a) Store the starting address of a segment
b) Store the size of a segment
c) Keep track of the free segments
d) Manage the segment table
Answer: b

143. The "page fault frequency (PFF)" algorithm is used to:
a) Control the rate of page faults
b) Manage the page table
c) Allocate page frames
d) Optimize disk access time

Answer: a

144. Which of the following is a disadvantage of "segmentation" in memory management?
a) Complexity of implementation
b) Internal fragmentation
c) External fragmentation
d) High overhead
Answer: c

145. In the context of memory management, what is "compaction"?
a) Reclaiming memory that is no longer in use
b) Allocating new memory
c) Defragmenting memory
d) Swapping out pages
Answer: c

146. The "working set model" is used to:
a) Keep frequently used pages in memory
b) Load pages on demand
c) Determine the optimal page size
d) Optimize disk access time
Answer: a

147. The "page fault handler" is a:
a) Hardware component
b) Software routine
c) Memory management unit
d) Disk management unit
Answer: b

148. Which of the following is true about the "least frequently used (LFU)" page replacement algorithm?
a) It replaces the page that has been used the least frequently
b) It replaces the page that has been used the most frequently
c) It replaces the page that has not been used for the longest time
d) It replaces the page that will not be used for the longest time
Answer: a

149. The "dirty bit" is also known as the:
a) Reference bit
b) Modify bit
c) Present bit
d) Access bit
Answer: b

150. The main purpose of the "swap space" in a virtual memory system is to:
a) Store frequently accessed pages
b) Store infrequently accessed pages

c) Store pages that are swapped out of memory
d) Store the page table
Answer: c

1. **CPU fetches the instruction from memory according to the value of:**
    - a) program counter
    - b) status register
    - c) instruction register
    - d) program status word
    - **Answer**: a) program counter [1]
2. **A memory buffer used to accommodate a speed differential is called:**
    - a) stack pointer
    - b) cache
    - c) accumulator
    - d) disk buffer
    - **Answer**: b) cache [1]
3. **Which one of the following is the address generated by CPU?**
    - a) physical address
    - b) absolute address
    - c) logical address
    - d) none of the mentioned
    - **Answer**: c) logical address [1]
4. **Run-time mapping from virtual to physical address is done by:**
    - a) Memory management unit
    - b) CPU
    - c) PCI
    - d) None of the mentioned
    - **Answer**: a) Memory management unit [1]
5. **Memory management technique in which the system stores and retrieves data from secondary storage for use in main memory is called:**
    - a) fragmentation
    - b) paging
    - c) mapping
    - d) none of the mentioned
    - **Answer**: b) paging [1]
6. **The address of a page table in memory is pointed to by:**
    - a) stack pointer
    - b) page table base register
    - c) page register
    - d) program counter
    - **Answer**: b) page table base register [1]
7. **Program always deals with:**
    - a) logical address
    - b) absolute address
    - c) physical address
    - d) relative address
    - **Answer**: a) logical address [1]
8. **The page table contains:**
    - a) base address of each page in physical memory

- b) page offset
- c) page size
- d) none of the mentioned
- **Answer**: a) base address of each page in physical memory [1]

9. **What is compaction?**
   - a) A technique for overcoming internal fragmentation
   - b) A paging technique
   - c) A technique for overcoming external fragmentation
   - d) A technique for overcoming fatal error
   - **Answer**: a) A technique for overcoming internal fragmentation [1]
10. **Operating System maintains the page table for:**
    - a) each process
    - b) each thread
    - c) each instruction
    - d) each address
    - **Answer**: a) each process [1]

11. **Which of the following is a disadvantage of using a fixed partitioning memory allocation technique?**
    - a) It leads to external fragmentation.
    - b) It requires dynamic relocation.
    - c) It results in inefficient memory utilization.
    - d) It cannot handle variable-sized processes.
    - **Answer**: a) It leads to external fragmentation [1].
12. **What is the purpose of a page table in virtual memory systems?**
    - a) To store the actual data of pages.
    - b) To map logical addresses to physical addresses.
    - c) To manage cache memory.
    - d) To handle interrupts.
    - **Answer**: b) To map logical addresses to physical addresses [1].
13. **Which memory management technique swaps entire processes in and out of main memory?**
    - a) Paging
    - b) Segmentation
    - c) Swapping
    - d) Fragmentation
    - **Answer**: c) Swapping [1].
14. **What is the purpose of a TLB (Translation Lookaside Buffer)?**
    - a) To store page table entries.
    - b) To cache frequently accessed pages.
    - c) To speed up address translation.
    - d) To manage virtual memory.
    - **Answer**: c) To speed up address translation [1].
15. **Which memory allocation technique allows processes to be allocated memory in non-contiguous chunks?**
    - a) Fixed partitioning
    - b) Dynamic partitioning
    - c) Paging
    - d) Segmentation
    - **Answer**: d) Segmentation [1].

16. **What is the purpose of a buddy system in memory management?**
    - a) To prevent memory leaks.
    - b) To allocate memory in fixed-size blocks.
    - c) To manage memory fragmentation.
    - d) To handle page faults.
    - **Answer**: b) To allocate memory in fixed-size blocks [1].
17. **Which memory management technique uses a page table to map logical addresses to physical addresses?**
    - a) Paging
    - b) Segmentation
    - c) Swapping
    - d) Fragmentation
    - **Answer**: a) Paging [1].
18. **What is the purpose of a free list in memory allocation?**
    - a) To track allocated memory blocks.
    - b) To manage cache memory.
    - c) To store available memory blocks.
    - d) To handle page faults.
    - **Answer**: c) To store available memory blocks [1].
19. **Which memory management technique allows processes to share memory segments?**
    - a) Paging
    - b) Segmentation
    - c) Swapping
    - d) Fragmentation
    - **Answer**: b) Segmentation [1].
20. **What is the role of a memory manager in an operating system?**
    - a) To allocate CPU time to processes.
    - b) To manage disk storage.
    - c) To allocate and deallocate memory.
    - d) To handle I/O operations.
    - **Answer**: c) To allocate and deallocate memory [1].

11. Which memory management technique uses fixed-size partitions?
    - a) Paging
    - b) Segmentation
    - c) Fragmentation
    - d) Swapping
    - **Answer: b) Segmentation** [1]
12. Which of the following is an example of external fragmentation?
    - a) Unused memory blocks scattered throughout the memory
    - b) Unused memory blocks adjacent to each other
    - c) Allocation of memory blocks in a contiguous manner
    - d) Allocation of memory blocks using paging
    - **Answer: a) Unused memory blocks scattered throughout the memory** [1]
13. Which memory management technique allows processes to be loaded into any available memory location?
    - a) Paging
    - b) Swapping
    - c) Contiguous allocation

- d) Fragmentation
- **Answer: a) Paging** [1]

14. In a paging system, what is the purpose of the page table?
    - a) To store the actual data of the process
    - b) To map logical addresses to physical addresses
    - c) To manage the CPU registers
    - d) To allocate memory blocks
    - **Answer: b) To map logical addresses to physical addresses** [1]
15. Which memory management technique uses a page table to translate logical addresses to physical addresses?
    - a) Paging
    - b) Segmentation
    - c) Swapping
    - d) Fragmentation
    - **Answer: a) Paging** [1]
16. What is the purpose of the Translation Lookaside Buffer (TLB) in memory management?
    - a) To store page tables
    - b) To cache frequently used page table entries
    - c) To manage memory allocation
    - d) To handle external fragmentation
    - **Answer: b) To cache frequently used page table entries** [1]
17. Which memory management technique allows processes to share memory segments?
    - a) Paging
    - b) Segmentation
    - c) Swapping
    - d) Fragmentation
    - **Answer: b) Segmentation** [1]
18. What is the main disadvantage of external fragmentation?
    - a) It wastes memory space
    - b) It slows down the CPU
    - c) It causes memory leaks
    - d) It leads to page faults
    - **Answer: a) It wastes memory space** [1]
19. Which memory management technique uses a fixed-size page table?
    - a) Paging
    - b) Segmentation
    - c) Swapping
    - d) Fragmentation
    - **Answer: a) Paging** [1]
20. What is the purpose of the Memory Management Unit (MMU) in a computer system?
    - a) To manage the CPU registers
    - b) To allocate memory blocks
    - c) To translate logical addresses to physical addresses
    - d) To handle external fragmentation
    - **Answer: c) To translate logical addresses to physical addresses** [1]

1. CPU fetches the instruction from memory according to the value of:
    - a) program counter
    - b) status register
    - c) instruction register

- d) program status word
- **Answer: a) program counter** [1]

2. A memory buffer used to accommodate a speed differential is called:
   - a) stack pointer
   - b) cache
   - c) accumulator
   - d) disk buffer
   - **Answer: d) disk buffer** [1]
3. Which one of the following is the address generated by the CPU?
   - a) physical address
   - b) absolute address
   - c) logical address
   - d) none of the mentioned
   - **Answer: c) logical address** [1]
4. Run-time mapping from virtual to physical address is done by:
   - a) Memory management unit
   - b) CPU
   - c) PCI
   - d) None of the mentioned
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5. The memory management technique in which the system stores and retrieves data from secondary storage for use in main memory is called:
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   - d) none of the mentioned
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6. The address of a page table in memory is pointed to by:
   - a) stack pointer
   - b) page table base register
   - c) page register
   - d) program counter
   - **Answer: b) page table base register** [1]
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   - a) logical address
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   - **Answer: a) base address of each page in physical memory** [1]
9. What is compaction?
   - a) A technique for overcoming internal fragmentation
   - b) A paging technique
   - c) A technique for overcoming external fragmentation
   - d) A technique for overcoming fatal error
   - **Answer: a) A technique for overcoming internal fragmentation** [1]

10. The operating system maintains the page table for:
    - a) each process
    - b) each thread
    - c) each instruction
    - d) each address
    - **Answer: a) each process** [1]