

1、 Which of the following is a benefit of allowing a program that is only partially in memory to execute? (D)

- A) Programs can be written to use more memory than is available in physical memory.
- B) CPU utilization and throughput is increased.
- C) Less I/O is needed to load or swap each user program into memory.
- D) All of the above

2、 In systems that support virtual memory, (D).

- A) virtual memory is separated from logical memory.
- B) virtual memory is separated from physical memory.
- C) physical memory is separated from secondary storage.
- D) physical memory is separated from logical memory.

3、 Suppose we have the following page accesses: 1, 2, 3, 4, 2, 3, 4, 1, 2, 1, 1, 3, 1, 4 and that there are three frames within our system. Using the FIFO replacement algorithm, what is the number of page faults for the given reference string? (B)

- A) 14
- B) 8
- C) 13
- D) 10

4、 Given the reference string of page accesses: 1, 2, 3, 4, 2, 3, 4, 1, 2, 1, 1, 3, 1, 4 and a system with three page frames, what is the final configuration of the three frames after the true LRU algorithm is applied? (B)

A) 1, 3, 4 B) 3, 1, 4 C) 4, 1, 2 D) 1, 2, 3

5、 Belady's anomaly states that (D).

A) giving more memory to a process will improve its performance

B) as the number of allocated frames increases, the page-fault rate may decrease for all page replacement algorithms

C) for some page replacement algorithms, the page-fault rate may decrease as the number of allocated frames increases

D) for some page replacement algorithms, the page-fault rate may increase as the number of allocated frames increases

6、 Optimal page replacement (B).

A) is the page-replacement algorithm most often implemented

B) is used mostly for comparison with other page-replacement schemes

C) can suffer from Belady's anomaly

D) requires that the system keep track of previously used pages

7、 The (C) allocation algorithm allocates available memory to each process according to its size.

A) equal B) global C) proportional D) slab

8、 (A) allows the parent and child processes to initially share the same pages, but when either process modifies a page, a copy of the shared page is created.

A) copy-on-write B) zero-fill-on-demand
C) memory-mapped D) virtual memory fork

9、 (D) is the algorithm implemented on most systems.

A) FIFO B) Least frequently used
C) Most frequently used D) LRU

10、 (A) occurs when a process spends more time paging than executing.

A) Thrashing B) Memory-mapping
C) Demand paging D) Swapping

11、 The (B) is an approximation of a program's locality.

A) locality model B) working set
C) page fault frequency D) page replacement algorithm

12、 Explain the distinction between a demand-paging system and a paging system with swapping.

13、 Explain the sequence of events that happens when a page-fault occurs.

12: A demand-paging system is similar to a paging system with swapping where processes reside in secondary memory. With demand paging, when a process is executed, it is swapped into memory. Rather than swapping the entire process into memory, however, a lazy swapper is used. A lazy swapper never swaps a page into memory unless that page will be needed. Thus, a paging system with swapping manipulates entire processes, whereas a demand pager is concerned with the individual pages of a process.

13: When the operating system cannot load the desired page into memory, a page-fault occurs. First, the memory reference is checked for validity. In the case of an invalid request, the program will be terminated. If the request was valid, a free frame is located. A disk operation is then scheduled to read the page into the frame just found, update the page table, restart the instruction that was interrupted because of the page fault, and use the page accordingly.