1. Which of the following is the primary purpose of virtual memory in an operating system?

a) Increase security  
b) Increase the speed of processing  
c) Allow programs to execute larger than physical memory  
d) Reduce the size of the operating system

1. In a paged memory system, the page table is used to:

a) Store the actual contents of the data  
b) Map virtual addresses to physical addresses  
c) Hold a copy of the operating system  
d) Protect the memory from illegal access

1. A page fault occurs when:

a) A program tries to access memory that doesn’t exist  
b) A program tries to modify read-only memory  
c) The required page is not in main memory  
d) The required page is in secondary memory

1. Which of the following techniques reduces page faults by keeping more pages in memory?

a) Paging  
b) Segmentation  
c) Demand Paging  
d) Pre-paging

1. What is thrashing in the context of virtual memory management? a) A condition where the operating system crashes  
   b) A condition where the system spends more time swapping pages in and out of memory than executing instructions  
   c) A condition where the memory is overloaded with data  
   d) A condition where the memory is fragmented
2. In the Least Recently Used (LRU) page replacement algorithm, which page is replaced?

a) The page with the lowest address  
b) The page that has not been used for the longest period of time  
c) The page that is the most frequently used  
d) The page that was loaded into memory the earliest

1. The concept of "working set" in virtual memory refers to:

a) The set of pages that the process is currently using  
b) The set of processes in the system  
c) The set of all pages in secondary storage  
d) The set of pages in the operating system

1. Which of the following is true about page replacement algorithms in virtual memory? a) They ensure that the system never experiences a page fault  
   b) They help determine which page to remove when a new page needs to be loaded  
   c) They prevent pages from being loaded into memory  
   d) They are used only when segmentation is employed
2. The "valid/invalid" bit in a page table indicates:

a) Whether the page is currently being used by the operating system  
b) Whether the page is in the cache or main memory  
c) Whether the page is in physical memory or not  
d) Whether the page is read-only or writable

1. Which of the following is a major advantage of using a virtual memory system? a) Faster CPU scheduling  
   b) Increased I/O device throughput  
   c) Efficient use of secondary storage  
   d) Ability to run larger programs than the physical memory size

**Answers:**

1. c) Allow programs to execute larger than physical memory
2. b) Map virtual addresses to physical addresses
3. c) The required page is not in main memory
4. d) Pre-paging
5. b) A condition where the system spends more time swapping pages in and out of memory than executing instructions
6. b) The page that has not been used for the longest period of time
7. a) The set of pages that the process is currently using
8. b) They help determine which page to remove when a new page needs to be loaded
9. c) Whether the page is in physical memory or not
10. d) Ability to run larger programs than the physical memory size

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