**Contiguous Memory Allocation**

1. **In contiguous memory allocation, each process is allocated:**
   * A) Non-adjacent memory blocks
   * B) A single contiguous block of memory
   * C) Multiple non-contiguous blocks of memory
   * D) None of the above
2. **Which of the following is a disadvantage of contiguous memory allocation?**
   * A) External fragmentation
   * B) Easy to implement
   * C) Efficient memory utilization
   * D) Simplifies the memory allocation process
3. **A process requires 50KB of memory. If there are free blocks of 30KB, 80KB, and 100KB, which block will be allocated using the first-fit strategy?**
   * A) 30KB
   * B) 80KB
   * C) 100KB
   * D) None of the above
4. **A memory block of 500KB is allocated to a process. The process only uses 300KB. How much memory is wasted due to internal fragmentation?**
   * A) 100KB
   * B) 200KB
   * C) 300KB
   * D) 400KB

**Paging**

1. **In paging, the size of a page is typically:**
   * A) Variable
   * B) Fixed
   * C) Dependent on the process
   * D) None of the above
2. **Which of the following statements is true about paging?**
   * A) Pages can be loaded into any available memory frame
   * B) Pages must be loaded into contiguous frames
   * C) Paging eliminates internal fragmentation
   * D) Paging does not require a page table
3. **If the page size is 4KB and a process requires 20KB of memory, how many pages will be needed to store the process?**
   * A) 4
   * B) 5
   * C) 6
   * D) 7
4. **Given a page table with 1024 entries and each entry is 4 bytes, what is the size of the page table?**
   * A) 2KB
   * B) 4KB
   * C) 4MB
   * D) 8KB

**Segmentation**

1. **Segmentation divides a program into:**
   * A) Fixed-size pages
   * B) Variable-size segments
   * C) Contiguous memory blocks
   * D) None of the above
2. **Which of the following is a key advantage of segmentation?**
   * A) Simplifies memory allocation
   * B) Reduces external fragmentation
   * C) Allows logical separation of a program's components
   * D) Eliminates the need for a page table
3. **A process has three segments of sizes 100KB, 200KB, and 300KB. What is the total size of memory required to load this process?**
   * A) 300KB
   * B) 500KB
   * C) 600KB
   * D) 700KB
4. **If a segment table has 256 entries and each entry is 8 bytes, what is the size of the segment table?**
   * A) 1KB
   * B) 2KB
   * C) 4KB
   * D) 8KB

**Answer:** D

**Types of Paging**

1. **In single-level paging, the page table contains:**
   * A) Multiple levels of entries
   * B) Only one level of entries
   * C) Inverted entries
   * D) None of the above
2. **Multi-level paging helps in:**
   * A) Reducing the size of the page table
   * B) Increasing the size of the page table
   * C) Eliminating the need for a page table
   * D) None of the above
3. **In a two-level paging system, if each page table has 512 entries and each entry is 4 bytes, what is the total size of the page tables required for a process?**
   * A) 2KB
   * B) 4KB
   * C) 8KB
   * D) 16KB
4. **If the physical address space is 2^32 bytes and the page size is 4KB, how many frames are there in the physical memory?**
   * A) 2^20
   * B) 2^22
   * C) 2^24
   * D) 2^30

**Virtual Memory: Paging**

1. **Virtual memory allows a computer to:**
   * A) Use more memory than physically available
   * B) Avoid using disk storage
   * C) Reduce the need for memory management
   * D) Eliminate the need for a page table
2. **In virtual memory, pages are swapped between:**
   * A) RAM and CPU
   * B) RAM and disk storage
   * C) Disk storage and CPU
   * D) None of the above
3. **A system with a 32-bit address space uses a page size of 8KB. How many bits are used for the page offset?**
   * A) 10
   * B) 11
   * C) 12
   * D) 13
4. **If a virtual memory system uses 4KB pages and a process has a virtual address space of 16MB, how many pages does the process have?**
   * A) 2048
   * B) 4096
   * C) 8192
   * D) 16384

**Page Replacement Algorithms**

1. **In the FIFO page replacement algorithm, which page is replaced first?**
   * A) The most recently used page
   * B) The least recently used page
   * C) The oldest page
   * D) The page with the highest number
2. **The LRU page replacement algorithm replaces the page that:**
   * A) Was used most recently
   * B) Was used least recently
   * C) Has the highest page number
   * D) Has the lowest page number
3. **In a FIFO page replacement algorithm, if there are 4 frames and the page reference string is 1, 2, 3, 4, 1, 2, 5, how many page faults will occur?**
   * A) 4
   * B) 5
   * C) 6
   * D) 7
4. **Using the LRU page replacement algorithm with 3 frames, what is the number of page faults for the page reference string 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2?**
   * A) 8
   * B) 9
   * C) 10
   * D) 11

**Allocation Strategies**

1. **In the first-fit memory allocation strategy, memory is allocated:**
   * A) To the smallest available block
   * B) To the largest available block
   * C) To the first available block that is large enough
   * D) None of the above
2. **The best-fit memory allocation strategy aims to:**
   * A) Minimize internal fragmentation
   * B) Minimize external fragmentation
   * C) Use the smallest available block that is large enough
   * D) Use the largest available block
3. **Using the best-fit memory allocation strategy, if there are free blocks of sizes 100KB, 500KB, 200KB, and 300KB, and a process needs 215KB, which block will be allocated?**
   * A) 100KB
   * B) 500KB
   * C) 200KB
   * D) 300KB
4. **In the worst-fit memory allocation strategy, if there are free blocks of sizes 120KB, 600KB, 350KB, and 400KB, and a process needs 150KB, which block will be allocated?**
   * A) 120KB
   * B) 600KB
   * C) 350KB
   * D) 400KB

**Thrashing**

1. **Thrashing occurs when:**
   * A) The CPU is underutilized
   * B) The system spends more time swapping pages than executing processes
   * C) There is too much internal fragmentation
   * D) The page table is too large
2. **Which of the following can help reduce thrashing?**
   * A) Increasing the size of the page table
   * B) Reducing the size of the page table
   * C) Increasing the physical memory
   * D) Reducing the process's working set size
3. **If a system has a physical memory of 4GB and the working set of a process is 2GB, how many processes can run simultaneously without causing thrashing if each process has a working set of 1GB?**
   * A) 2
   * B) 3
   * C) 4
   * D) 5
4. **If the page fault rate increases to 1 per second and the disk access time is 10 milliseconds, what is the effective access time if the memory access time is 100 nanoseconds?**
   * A) 10.1 milliseconds
   * B) 10.01 milliseconds
   * C) 10.001 milliseconds
   * D) 10.0001 milliseconds