#	Question	Suggested Answer	What Interviewers Look For
1	What is memory management in operating systems?	Memory management is the process of controlling and coordinating computer memory, assigning portions to programs to optimize overall system performance.	Conceptual clarity of memory operations and OS responsibilities.
2	What is the difference between logical and physical address space?	Logical address is generated by the CPU; physical address is the actual location in memory.	Understanding of address translation.
3	Define fragmentation and its types.	Fragmentation is the unused memory left after allocation. It can be internal (within a block) or external (between blocks).	Awareness of resource wastage and memory utilization.
4	What is paging in memory management?	Paging divides memory into fixed-size pages and frames to avoid external fragmentation.	Understanding of memory allocation strategies.
5	What is a page table?	A page table maps logical addresses to physical addresses in a paging system.	Knowledge of address translation and memory structures.
6	What is virtual memory?	Virtual memory enables execution of processes not completely in main memory by using disk space.	Concept of demand paging and logical abstraction.
7	How is segmentation different from paging?	Segmentation divides memory based on logical divisions, paging uses fixed-size blocks.	Understanding structural memory allocation differences.
8	What is demand paging?	In demand paging, pages are loaded into memory only when required.	Awareness of lazy loading and page fault handling.
9	Define page fault.	A page fault occurs when a program tries to access a page not currently in memory.	Understanding of page replacement scenarios.
10	What is a frame?	A frame is a fixed-size block in physical memory where pages are loaded.	Clear grasp of paging components.

11	What is thrashing?	Thrashing happens when a system spends more time swapping pages than executing processes.	Recognition of performance bottlenecks.
12	What is the working set model?	It defines a set of pages used by a process during a fixed time window to reduce page faults.	Understanding of locality and memory optimization.
13	Explain first-fit, best-fit, and worst-fit memory allocation.	First-fit allocates the first available block, best-fit the smallest that fits, worst-fit the largest.	Clarity in memory allocation strategies.
14	What is swapping?	Swapping moves processes between main memory and disk to manage memory.	Knowledge of memory space reuse and process management.
15	What are the advantages of paging?	Eliminates external fragmentation, simplifies allocation, enables virtual memory.	Insight into memory management benefits.
16	What is internal fragmentation?	Wasted space within allocated memory blocks due to fixed-size allocation.	Understanding inefficiencies in memory usage.
17	What is external fragmentation?	Unused memory between allocated blocks that cannot be used effectively.	Awareness of dynamic allocation drawbacks.
18	How does the TLB (Translation Lookaside Buffer) help in paging?	TLB caches page table entries to speed up address translation.	Understanding of memory access optimization.
19	What is a page replacement algorithm?	It decides which memory page to replace when a page fault occurs.	Familiarity with memory management strategies.
20	Name and explain any two page replacement algorithms.	FIFO: removes oldest page. LRU: removes least recently used page.	Practical application of algorithms.
21	What is the difference between LRU and FIFO?	LRU considers usage history; FIFO follows arrival order.	Depth in understanding replacement efficiency.
22	What is segmentation fault?	A segmentation fault occurs when a program tries to access unauthorized memory.	Awareness of memory protection and access violations.
23	How is memory protected in OS?	OS uses base and limit registers, paging, and segmentation with protection bits.	Understanding of access control mechanisms.

24	What is the role of memory management unit (MMU)?	MMU translates virtual addresses to physical addresses and manages memory protection.	Clarity in hardware-assisted memory management.
25	How is memory allocation handled in multiprogramming?	The OS divides memory among multiple processes, ensuring isolation and efficient use.	Grasp of multitasking requirements.
26	What is the buddy system in memory allocation?	It is a method of splitting memory into power-of-two blocks to reduce fragmentation.	Awareness of dynamic allocation techniques.
27	How does garbage collection relate to memory management?	It automatically reclaims memory no longer in use, typically in high-level languages.	Understanding automated memory handling.
28	What are memory leaks?	Memory that is no longer used but not released, leading to reduced performance.	Insight into potential issues in long-running processes.
29	What is compaction?	Compaction moves memory contents to eliminate fragmentation and free up contiguous space.	Understanding of memory optimization techniques.
30	What are resident and non-resident memory?	Resident memory stays in RAM, non-resident may be swapped to disk.	Clarity on memory prioritization and management.