

UNIT-IV: Memory Management and Virtual Memory

Multiple Choice Questions (MCQs)

1. Memory management is responsible for:

- a) Managing CPU scheduling
- b) Managing main memory efficiently
- c) Managing files only
- d) Managing I/O devices

Answer: b) Managing main memory efficiently

2. The address generated by the CPU is called:

- a) Physical address
- b) Logical address
- c) Absolute address
- d) Virtual frame

Answer: b) Logical address

3. The actual address in main memory is known as:

- a) Logical address
- b) Virtual address
- c) Physical address
- d) Relative address

Answer: c) Physical address

4. Which hardware component translates logical addresses into physical addresses?

- a) ALU
- b) MMU (Memory Management Unit)
- c) Cache
- d) Register

Answer: b) MMU (Memory Management Unit)

5. Swapping is a technique in which:

- a) Processes are exchanged between main memory and secondary storage
- b) Pages are deleted from memory

- c) Files are copied to disks
- d) CPU schedules processes

Answer: a) Processes are exchanged between main memory and secondary storage

6. In contiguous memory allocation, each process occupies:

- a) Non-contiguous memory locations
- b) A single continuous block of memory
- c) Multiple pages only
- d) Segments only

Answer: b) A single continuous block of memory

7. Internal fragmentation occurs in:

- a) Paging
- b) Segmentation
- c) Contiguous allocation with fixed partitions
- d) Demand paging

Answer: c) Contiguous allocation with fixed partitions

8. Paging divides logical memory into fixed-size blocks called:

- a) Frames
- b) Pages
- c) Segments
- d) Partitions

Answer: b) Pages

9. Physical memory in a paging system is divided into:

- a) Pages
- b) Segments
- c) Frames
- d) Blocks

Answer: c) Frames

10. Which memory management technique eliminates external fragmentation?

- a) Contiguous allocation
- b) Paging
- c) Segmentation
- d) Swapping

Answer: b) Paging

11. Segmentation divides a program into:

- a) Equal-sized blocks
- b) Variable-sized logical units
- c) Fixed partitions
- d) Frames only

Answer: b) Variable-sized logical units

12. Examples of segments include:

- a) Pages and frames
- b) Main memory and cache
- c) Code, data, and stack
- d) Registers and cache

Answer: c) Code, data, and stack

13. Segmentation with paging combines the advantages of:

- a) Paging and segmentation
- b) Swapping and paging
- c) Segmentation and swapping
- d) Contiguous allocation and swapping

Answer: a) Paging and segmentation

14. Demand paging loads pages into memory:

- a) Before program execution
- b) Only when they are needed
- c) At system startup
- d) After process termination

Answer: b) Only when they are needed

15. A page fault occurs when:

- a) The page is found in memory
- b) The required page is not present in memory
- c) The CPU crashes
- d) The disk is full

Answer: b) The required page is not present in memory

16. Which page replacement algorithm replaces the oldest page in memory?

- a) LRU
- b) FIFO
- c) Optimal
- d) LFU

Answer: b) FIFO

17. The LRU algorithm replaces the page that:

- a) Was loaded first
- b) Will not be used for the longest period in future
- c) Has not been used for the longest time
- d) Has the smallest size

Answer: c) Has not been used for the longest time

18. Which page replacement algorithm gives the minimum number of page faults?

- a) FIFO
- b) LRU
- c) Optimal
- d) Random

Answer: c) Optimal

19. The phenomenon in which increasing the number of frames increases page faults is called:

- a) Thrashing
- b) Belady's Anomaly
- c) Swapping
- d) Fragmentation

Answer: b) Belady's Anomaly

20. Excessive paging activity in a system is known as:

- a) Segmentation
- b) Swapping
- c) Thrashing
- d) Fragmentation

Answer: c) Thrashing

Fill in the Blanks

1. The address generated by the CPU is called a _____ address.
Answer: logical
2. The actual location in main memory is called a _____ address.
Answer: physical
3. The hardware responsible for address translation is the _____.
Answer: MMU (Memory Management Unit)
4. The process of moving processes between memory and disk is called _____.
Answer: swapping
5. In contiguous allocation, each process occupies a single _____ block of memory.
Answer: contiguous
6. Paging divides logical memory into fixed-size _____.
Answer: pages
7. Physical memory is divided into fixed-size units called _____.
Answer: frames
8. Paging eliminates _____ fragmentation.
Answer: external
9. Segmentation divides memory into _____-sized logical units.
Answer: variable
10. Examples of segments include code, data, and _____.
Answer: stack
11. Demand paging loads pages only when they are _____.
Answer: needed
12. When a required page is absent from memory, a _____ fault occurs.
Answer: page
13. FIFO stands for **First In First** _____.
Answer: Out
14. The LRU algorithm stands for **Least Recently** _____.
Answer: Used
15. The algorithm that provides the best performance theoretically is the _____.
Answer: page replacement algorithm.
16. Excessive paging activity is known as _____.
Answer: thrashing
17. Belady's anomaly is commonly associated with the _____ page replacement algorithm.
Answer: FIFO
18. Segmentation with paging combines both _____ and paging techniques.
Answer: segmentation
19. Internal fragmentation occurs when memory allocated is larger than the memory _____.
Answer: required
20. Virtual memory allows programs larger than physical memory to be _____.
Answer: executed