1. Which of the following best describes a file in a file system?
a) A physical storage device
b) A logical storage unit containing related data
c) An executable program
d) A directory

Answer: b) A logical storage unit containing related data

Explanation: In a file system, a file is a logical storage unit that contains related data or information.

2. What is the user's view of a file system?
a) Low-level organization of disk blocks
b) High-level organization of files and directories
c) Management of system resources
d) Interaction with device drivers

Answer: b) High-level organization of files and directories

Explanation: The user interacts with the file system at a high level, dealing primarily with files and directories rather than low-level disk structures.

3. Which disk organization method involves dividing the disk into fixed-size units called blocks or sectors?
a) Contiguous allocation
b) Linked allocation
c) Indexed allocation
d) None of the above

Answer: d) None of the above

Explanation: Dividing the disk into fixed-size units is a characteristic of disk organization in general, rather than a specific method like contiguous, linked, or indexed allocation.

4. In which disk space allocation method are files stored in non-contiguous blocks, linked together by pointers?
a) Contiguous allocation
b) Linked allocation
c) Indexed allocation
d) Clustered allocation

Answer: b) Linked allocation

Explanation: In linked allocation, files are stored in non-contiguous blocks, with each block containing a pointer to the next block.

5. What is the primary advantage of contiguous allocation?
a) Efficient use of disk space
b) Easy to implement
c) Low fragmentation
d) Supports dynamic file sizes

Answer: c) Low fragmentation

Explanation: Contiguous allocation minimizes fragmentation because each file occupies a contiguous block of disk space.

6. Which directory structure allows for a hierarchical organization of files and directories?
a) Single-level directory
b) Two-level directory
c) Tree-structured directory
d) Acyclic directory

Answer: c) Tree-structured directory

Explanation: In a tree-structured directory, files and directories are organized in a hierarchical manner, similar to the structure of a tree.

7. What is the purpose of file protection mechanisms in a file system?
a) To encrypt files for security
b) To prevent unauthorized access to files
c) To compress files for efficient storage
d) To improve disk performance

Answer: b) To prevent unauthorized access to files

Explanation: File protection mechanisms control access to files, ensuring that only authorized users can read, write, or execute them.

8. Which system calls are used for basic file management operations such as opening, reading, writing, and closing files?
a) Input/output system calls
b) File system calls
c) Process management system calls
d) Memory management system calls

Answer: b) File system calls

Explanation: File system calls provide an interface for performing basic file management operations within programs.

9. Which disk scheduling algorithm aims to minimize the average response time for disk requests?
a) First-Come, First-Served (FCFS)
b) Shortest Seek Time First (SSTF)
c) SCAN
d) C-SCAN

Answer: b) Shortest Seek Time First (SSTF)

Explanation: SSTF selects the disk request that requires the least movement of the disk arm from its current position, minimizing seek time and improving response time.

10. Which disk scheduling algorithm traverses the disk in a circular manner, serving all requests in one direction before reversing?
a) First-Come, First-Served (FCFS)
b) Shortest Seek Time First (SSTF)
c) SCAN
d) C-SCAN

Answer: c) SCAN

Explanation: SCAN traverses the disk in a circular manner, servicing all requests in one direction before reversing direction and serving requests in the opposite direction.

11. What does the indexed allocation method use to store pointers to disk blocks of a file?
a) A linked list
b) A table of pointers
c) A bitmap
d) A tree structure

Answer: b) A table of pointers

Explanation: Indexed allocation uses a table of pointers, known as an index block, to store pointers to disk blocks of a file.

12. Which disk space allocation method suffers from the “external fragmentation” problem?
a) Contiguous allocation
b) Linked allocation
c) Indexed allocation
d) Clustered allocation

Answer: a) Contiguous allocation

Explanation: Contiguous allocation can lead to external fragmentation, where free space is broken into small, non-contiguous chunks, making it challenging to allocate large contiguous blocks for new files.

13. In which directory structure does each file have a unique path from the root directory?
a) Single-level directory
b) Two-level directory
c) Tree-structured directory
d) Acyclic directory

Answer: c) Tree-structured directory

Explanation: In a tree-structured directory, each file has a unique path from the root directory, reflecting its hierarchical organization.

14. Which disk scheduling algorithm provides fairness to all requests by servicing them in the order they arrive?
a) First-Come, First-Served (FCFS)
b) Shortest Seek Time First (SSTF)
c) SCAN
d) C-SCAN

Answer: a) First-Come, First-Served (FCFS)

Explanation: FCFS services disk requests in the order they arrive, providing fairness to all requests by following a first-come, first-served approach.

15. What is the purpose of a file system's directory structure?
a) To manage disk space allocation
b) To control access to files
c) To organize files and directories
d) To improve disk performance

Answer: c) To organize files and directories

Explanation: The directory structure organizes files and directories in a logical hierarchy, facilitating efficient storage and retrieval of data.

16. Which disk space allocation method allows for efficient access to files but may suffer from increased overhead due to maintaining index structures?
a) Contiguous allocation
b) Linked allocation
c) Indexed allocation
d) Clustered allocation

Answer: c) Indexed allocation

Explanation: Indexed allocation allows for efficient access to files through index structures, but maintaining these structures can incur overhead, especially as the file system grows.

17. What is the primary disadvantage of linked allocation?
a) High disk fragmentation
b) Inefficient use of disk space
c) Difficulty in implementing file deletion
d) Limited support for large files

Answer: b) Inefficient use of disk space

Explanation: Linked allocation can result in inefficient use of disk space due to the overhead of storing pointers to link blocks together.

18. Which disk scheduling algorithm may result in starvation for certain requests?
a) First-Come, First-Served (FCFS)
b) Shortest Seek Time First (SSTF)
c) SCAN
d) C-SCAN

Answer: c) SCAN

Explanation: SCAN may prioritize servicing requests closer to the current position of the disk arm, potentially causing starvation for requests located further away.

19. Which module of a file system is responsible for translating logical file operations into physical disk operations?
a) File organization module
b) File allocation module
c) Disk management module
d) Directory management module

Answer: a) File organization module

Explanation: The file organization module translates logical file operations (such as read and write) into physical disk operations, managing the mapping between logical and physical addresses.

20. What is the primary advantage of clustered allocation?
a) Low disk fragmentation
b) Efficient use of disk space
c) Fast access to files
d) Easy implementation of file deletion

Answer: c) Fast access to files

Explanation: Clustered allocation improves file access speed by grouping contiguous clusters of disk blocks together, reducing seek time when accessing consecutive blocks of a file.

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