Import Settings:
Base Settings: Brownstone Default
Highest Answer Letter: D
Multiple Keywords in Same Paragraph: No

Chapter: Chapter 12

Multiple Choice

1. The surface of a magnetic disk platter is divided into ____.
A) sectors
B) arms
C) tracks
D) cylinders

Ans: C
Feedback: 12.1.1.
Difficulty: Easy

2. On media that uses constant linear velocity, the ____.
A) disk's rotation speed increases as the head moves towards the middle of the disk from either side
B) disk's rotation speed remains constant
C) density of bits decreases from the inner tracks to the outer tracks
D) density of bits per track is uniform

Ans: D
Feedback: 12.2
Difficulty: Difficult

3. The SSTF scheduling algorithm ____.
A) services the request with the maximum seek time
B) services the request with the minimum seek time
C) chooses to service the request furthest from the current head position
D) None of the above

Ans: B
Feedback: 12.4.2
Difficulty: Medium

4. Consider a disk queue holding requests to the following cylinders in the listed order: 116, 22, 3, 11, 75, 185, 100, 87. Using the SCAN scheduling algorithm, what is the order that the requests are serviced, assuming the disk head is at cylinder 88 and moving upward through the cylinders?
A) 116 - 22 - 3 - 11 - 75 - 185 - 100 - 87
B) 100 - 116 - 185 - 87 - 75 - 22 - 11 - 3
C) 87 - 75 - 100 - 116 - 185 - 22 - 11 - 3
D) 100 - 116 - 185 - 3 - 11 - 22 - 75 - 87

Ans: B
Feedback: 12.4.3
Difficulty: Medium

5. Consider a disk queue holding requests to the following cylinders in the listed order: 116, 22, 3, 11, 75, 185, 100, 87. Using the FCFS scheduling algorithm, what is the order that the requests are serviced, assuming the disk head is at cylinder 88 and moving upward through the cylinders?
A) 116 - 22 - 3 - 11 - 75 - 185 - 100 - 87
B) 100 - 116 - 185 - 87 - 75 - 22 - 11 - 3
C) 87 - 75 - 100 - 116 - 185 - 22 - 11 - 3
D) 100 - 116 - 185 - 3 - 11 - 22 - 75 – 87

Ans: A
Feedback: 12.4.1
Difficulty: Easy

6. Consider a disk queue holding requests to the following cylinders in the listed order: 116, 22, 3, 11, 75, 185, 100, 87. Using the SSTF scheduling algorithm, what is the order that the requests are serviced, assuming the disk head is at cylinder 88 and moving upward through the cylinders?
A) 116 - 22 - 3 - 11 - 75 - 185 - 100 - 87
B) 100 - 116 - 185 - 87 - 75 - 22 - 11 - 3
C) 87 - 75 - 100 - 116 - 185 - 22 - 11 - 3
D) 100 - 116 - 185 - 3 - 11 - 22 - 75 - 87

Ans: C
Feedback: 12.4.2
Difficulty: Medium

7. Consider a disk queue holding requests to the following cylinders in the listed order: 116, 22, 3, 11, 75, 185, 100, 87. Using the C-SCAN scheduling algorithm, what is the order that the requests are serviced, assuming the disk head is at cylinder 88 and moving upward through the cylinders?
A) 116 - 22 - 3 - 11 - 75 - 185 - 100 - 87
B) 100 - 116 - 185 - 87 - 75 - 22 - 11 - 3
C) 87 - 75 - 100 - 116 - 185 - 22 - 11 - 3
D) 100 - 116 - 185 - 3 - 11 - 22 - 75 - 87

Ans: D
Feedback: 12.4.4
Difficulty: Medium

8. Low-level formatting ____.
A) does not usually provide an error-correcting code
B) is usually performed by the purchaser of the disk device
C) is different from physical formatting
D) divides a disk into sections that the disk controller can read and write

Ans: D
Feedback: 12.2
Difficulty: Medium

9. Host-attached storage is ____.
A) a special purpose storage system that is accessed remotely over a data network
B) not suitable for hard disks
C) accessed via local I/O ports
D) not suitable for use in raid arrays

Ans: C
Feedback: 12.3.1
Difficulty: Medium

10. Swap space management ____.
A) is a high-level operating system task
B) tries to provide the best throughput for the virtual memory system
C) is primarily used to increase the reliability of data in a system
D) None of the above

Ans: B
Feedback: 12.6
Difficulty: Medium

11 A RAID structure ____.
A) is primarily used for security reasons
B) is primarily used to ensure higher data reliability
C) stands for redundant arrays of inexpensive disks
D) is primarily used to decrease the dependence on disk drives

Ans: B
Feedback: 12.7
Difficulty: Medium

12. RAID level ____ is the most common parity RAID system.
A) 0
B) 0+1
C) 4
D) 5

Ans: D
Feedback: 12.7
Difficulty: Medium

13. Which of the following disk head scheduling algorithms does not take into account the current position of the disk head?
A) FCFS
B) SSTF
C) SCAN
D) LOOK

Ans: A
Feedback: 12.4
Difficulty: Easy

14. The location where Windows places its boot code is the _____.
A) boot block

B) master boot record (MBR)
C) boot partition
D) boot disk

Ans: B
Feedback: 12.5.2
Difficulty: Medium

15. What are the two components of positioning time?
A) seek time + rotational latency
B) transfer time + transfer rate
C) effective transfer rate - transfer rate
D) cylinder positioning time + disk arm positioning time

Ans: A
Feedback: 12.1
Difficulty: Medium

16. Which of the following statements is false?
A) Swapping works in conjunction with virtual memory techniques.
B) Some systems allow for multiple swap spaces (disks).
C) Solaris only swaps pages of anonymous memory.
D) Typically, entire processes are swapped into memory.

Ans: D
Feedback: 12.6
Difficulty: Medium

17. _____ is a technique for managing bad blocks that maps a bad sector to a spare sector.
A) Sector slipping
B) Sector sparing
C) Bad block mapping
D) Hard error management

Ans: B
Feedback: 12.5.3
Difficulty: Medium

18. Which RAID level is best for storing large volumes of data?
A) RAID levels 0 + 1 and 1 + 0
B) RAID level 3
C) RAID level 4
D) RAID level 5

Ans: D
Feedback: 12.7.4
Difficulty: Medium

19. A _____ is a private network connecting servers and storage units.
A) host-attached storage
B) network-attached storage
C) storage-area network
D) private-area network

Ans: C
Feedback: 12.3
Difficulty: Medium

20. Which of the following statements regarding solid state disks (SSDs) is false?
A) They generally consume more power than traditional hard disks.
B) They have the same characteristics as magnetic hard disks, but can be more reliable.
C) They are generally more expensive per megabyte than traditional hard disks.
D) They have no seek time or latency.

Ans: A
Feedback: 12.1.2
Difficulty: Medium

21. Solid state disks (SSDs) commonly use the _____ disk scheduling policy.
A) SSTF
B) SCAN
C) FCFS
D) LOOK

Ans: C
Feedback: 12.4
Difficulty: Medium

Essay

22. What is constant angular velocity in relation to disk drives?

Ans: If the rotation speed of a disk is to remain constant, the density of the bits must be changed for different tracks to ensure the same rate of data moving under the head. This method keeps a constant angular velocity on the disk.
Feedback: 12.2
Difficulty: Medium

23. What is a storage-area network?

Ans: A storage-area network (SAN) is a private network (using storage protocols rather than networking protocols) connecting servers and storage units. The power of a SAN lies in its flexibility. Multiple hosts and multiple storage arrays can attach to the same SAN, and storage can be dynamically allocated to hosts.
Feedback: 12.3.3
Difficulty: Medium

24. What is a disadvantage of the SSTF scheduling algorithm?

Ans: Although the SSTF algorithm is a substantial improvement over the FCFS algorithm, it is not optimal. SSTF may cause starvation of some requests. If a continual stream of requests arrives near one another, a request of a cylinder far away from the head position has to wait indefinitely.
Feedback: 12.4.2
Difficulty: Medium

25. What is the advantage of LOOK over SCAN disk head scheduling?

Ans: The LOOK algorithm is a type of SCAN algorithm. The difference is that, instead of forcing the disk head to fully traverse the disk, as is done in the SCAN algorithm, the disk head moves only as far as the final request in each direction.
Feedback: 12.4.5
Difficulty: Medium

26. What are the factors influencing the selection of a disk-scheduling algorithm?

Ans: Performance of a scheduling algorithm depends heavily on the number and types of requests. Requests for disk service can be greatly influenced by the file-allocation method. The location of directories and index blocks is also important. Other considerations for scheduling may involve rotational latency (instead of simply seek distances) and operating system constraints, such as demand paging.
Feedback: 12.4.5
Difficulty: Medium

27. Describe one technique that can enable multiple disks to be used to improve data transfer rate.

Ans: One technique is bit-level striping. Bit-level striping consists of splitting the bits of each byte across multiple disks so that the data can be accessed from multiple disks in parallel. Another method is block-level striping where blocks of a file are striped across multiple disks.
Feedback: 12.7.2
Difficulty: Difficult

28. Describe an approach for managing bad blocks.

Ans: One approach to managing bad blocks is sector sparing. When the disk controller detects a bad sector, it reports it to the operating system. The operating system will then replace the bad sector with a spare sector. Whenever the bad sector is requested, the operating system will translate the request to the spare sector.
Feedback: 12.5.3
Difficulty: Medium

29. Describe why Solaris systems only allocate swap space when a page is forced out of main memory, rather than when the virtual memory page is first created.

Ans: Solaris systems only allocate swap space when a page is force out of main memory, because modern computers typically have much more physical memory than older systems and—as a result—page less frequently. A second reason is that Solaris only swaps anonymous pages of memory.
Feedback: 12.6.3
Difficulty: Medium

30. Describe how ZFS uses checksums to maintain the integrity of data.

Ans: ZFS maintains checksums of all data and metadata blocks. When the file system detects a bad checksum for a block, it replaces the bad block with a mirrored block that has a valid checksum.
Feedback: 12.7.6
Difficulty: Medium

True/False

31. Disk controllers do not usually have a built-in cache.

Ans: False
Feedback: 12.1.1
Difficulty: Medium

32. In Solaris, swap space is only used as a backing store for pages of anonymous memory.

Ans: True
Feedback: 12.6.3
Difficulty: Medium

33. In asynchronous replication, each block is written locally and remotely before the write is considered complete.

Ans: False
Feedback: 12.7
Difficulty: Difficult

34. Solid state disks (SSDs) commonly use the FCFS disk scheduling algorithm.

Ans: True
Feedback: 12.4
Difficulty: Easy

35. In most RAID implementations, a hot spare disk is not used for data, but is configured for replacement should any other disk fail.

Ans: True
Feedback: 12.7.3
Difficulty: Easy

36. LOOK disk head scheduling offers no practical benefit over SCAN disk head scheduling.

Ans: False
Feedback: 12.4.5
Difficulty: Difficult

37. Windows allows a hard disk to be divided into one or more partitions

Ans: True
Feedback: 12.5.2
Difficulty: Easy

38. RAID level 0 provides no redundancy.

Ans: True
Feedback: 12.7.3
Difficulty: Easy

39. Data striping provides reliability for RAID systems.

Ans: False
Feedback: 12.7.2
Difficulty: Medium

40. In general, LOOK disk head scheduling will involve less movement of the disk heads than SCAN disk head scheduling.

Ans: True
Feedback: 12.4
Difficulty: Medium