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1. What is the primary function of secondary storage devices?

   a. To process data

   b. To provide temporary storage for active data

   c. To store data and programs permanently

   d. To perform arithmetic operations

   Answer: c. To store data and programs permanently

   Explanation: Secondary storage devices are designed to store data, rograms, and files permanently. They retain data even when the power is turned off, unlike primary storage which is temporary and volatile.

2. Which of the following is an example of an optical storage device?

   a. Hard Disk Drive (HDD)

   b. USB Flash Drive

   c. DVD

   d. Solid State Drive (SSD)

   Answer: c. DVD

   Explanation: A DVD (Digital Versatile Disc) is an optical storage device that uses laser technology to read and write data. Unlike HDDs, SSDs, and USB drives, which use magnetic or flash memory, optical storage devices like DVDs and CDs use light to read/write data.

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3. What does the acronym 'CD' stand for in the context of optical storage?

   a. Compact Disk

   b. Compact Device

   c. Central Disk

   d. Control Device

   Answer: a. Compact Disk

   Explanation: CD stands for Compact Disc. It is an optical storage medium that uses laser technology to read and write data. CDs were originally developed for storing audio but later adapted for data storage.

4. Which of the following has the highest storage capacity?

   a. CD-ROM

   b. DVD

   c. Blu-ray Disc

   d. Floppy Disk

   Answer: c. Blu-ray Disc

   Explanation: Blu-ray Discs have the highest storage capacity among the options listed. A standard single-layer Blu-ray Disc can store up to 25 GB of data, while a double-layer disc can store up to 50 GB. DVDs typically store up to 4.7 GB, and CDs up to 700 MB. Floppy Disks, on the other hand, have very low storage capacity (1.44 MB).

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5. Which technology is primarily used by optical storage devices to read and write data?

   a. Magnetic field

   b. Laser

   c. Electrical charge

   d. Mechanical arm

   Answer: b. Laser

   Explanation: Optical storage devices like CDs, DVDs, and Blu-ray Discs use laser technology to read and write data. The laser beams read the data encoded in the form of tiny pits and lands on the disc's surface.

6. Which type of optical disc allows data to be written, erased, and rewritten multiple times?

   a. CD-ROM

   b. DVD-ROM

   c. Blu-ray Disc

   d. CD-RW

   Answer: d. CD-RW

   Explanation: CD-RW (Compact Disc Rewritable) allows users to write, erase, and rewrite data multiple times. In contrast, CD-ROM (Read-Only Memory) and DVD-ROM are read-only formats, meaning data can be read but not modified or erased.

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7. What is the typical storage capacity of a standard DVD?

   a. 700 MB

   b. 4.7 GB

   c. 25 GB

   d. 1.44 MB

   Answer: b. 4.7 GB

   Explanation: A standard single-layer DVD has a storage capacity of 4.7 GB. Dual-layer DVDs can store up to 8.5 GB. CDs typically hold 700 MB, while Blu-ray Discs and Floppy Disks have different capacities as mentioned earlier.

8. Which of the following optical storage formats is best suited for high-definition video storage?

   a. CD-ROM

   b. DVD

   c. Blu-ray Disc

   d. CD-RW

   Answer: c. Blu-ray Disc

   Explanation: Blu-ray Discs are designed to store high-definition (HD) video content. They offer higher storage capacities compared to CDs and DVDs, making them ideal for storing large HD video files and other high-capacity data.

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9. What does the 'R' in CD-R and DVD-R stand for?

   a. Read

   b. Rewritable

   c. Recordable

   d. Random

   Answer: c. Recordable

   Explanation: The 'R' in CD-R and DVD-R stands for "Recordable." These discs allow data to be written (recorded) once, but cannot be erased or rewritten. This is in contrast to CD-RW and DVD-RW, where 'RW' stands for "Rewritable," meaning data can be erased and written multiple times.

10. Which of the following is a write-once optical storage format?

    a. CD-R

    b. DVD-RW

    c. Blu-ray RE

    d. CD-RW

    Answer: a. CD-R

    Explanation: CD-R (Compact Disc Recordable) is a write-once format, meaning data can be recorded onto the disc only once. After data is written, it cannot be erased or modified. DVD-R and Blu-ray R discs also follow the same principle. In contrast, CD-RW, DVD-RW, and Blu-ray RE (Rewritable) discs can be rewritten multiple times.

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11. Which of the following is an advantage of optical storage devices?

    a. Fast read/write speeds compared to HDDs

    b. Large storage capacity compared to SSDs

    c. Durability and resistance to environmental factors

    d. Unlimited rewrite cycles

    Answer: c. Durability and resistance to environmental factors

    Explanation: Optical storage devices are generally more durable and resistant to environmental factors such as dust, heat, and magnetic fields compared to other storage types.

12. Which of the following is an example of a magnetic storage device?

    a. DVD

    b. SSD

    c. Hard Disk Drive (HDD)

    d. Blu-ray Disc

    Answer: c. Hard Disk Drive (HDD)

    Explanation: A Hard Disk Drive (HDD) is a magnetic storage device that uses magnetic disks to store data. It relies on spinning platters coated with magnetic material, where data is read and written using a magnetic head.

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13. What is the main characteristic of magnetic storage devices?

    a. Use of laser technology

    b. Use of magnetic material to store data

    c. Use of electronic circuits

    d. Use of optical fibers

    Answer: b. Use of magnetic material to store data

    Explanation: Magnetic storage devices store data by magnetizing tiny regions on a disk or tape. This characteristic is what differentiates magnetic storage from optical and solid-state storage technologies.

14. Which of the following is NOT a magnetic storage device?

    a. Floppy Disk

    b. Magnetic Tape

    c. Hard Disk Drive (HDD)

    d. CD-ROM

    Answer: d. CD-ROM

    Explanation: A CD-ROM (Compact Disc Read-Only Memory) is an optical storage device, not a magnetic one. It uses laser technology to read data. In contrast, Floppy Disks, Magnetic Tapes, and Hard Disk Drives (HDDs) are examples of magnetic storage devices.

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15. Which component of a Hard Disk Drive (HDD) is responsible for reading and writing data?

    a. Spindle

    b. Actuator Arm

    c. Read/Write Head

    d. Platter

    Answer: c. Read/Write Head

    Explanation: The read/write head in an HDD is responsible for reading and writing data on the platters. It hovers just above the spinning platters and alters the magnetic fields on the disk surface to write data, or reads the magnetic fields to retrieve data.

16. What is the primary use of magnetic tape storage?

    a. Storing frequently accessed files

    b. Short-term storage

    c. Long-term archival and backup storage

    d. Temporary storage during processing

    Answer: c. Long-term archival and backup storage

    Explanation: Magnetic tape storage is typically used for long-term archival and backup purposes due to its high capacity and durability. Although slower to access compared to other storage types, it is cost-effective for storing large volumes of data that do not need to be accessed frequently.

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17. Which of the following magnetic storage devices is portable and was commonly used in the 1980s and 1990s?

    a. Magnetic Tape

    b. SSD

    c. Floppy Disk

    d. CD-R

    Answer: c. Floppy Disk

    Explanation: The Floppy Disk was a widely used portable magnetic storage device in the 1980s and 1990s. It was used to store and transfer data between computers but has since become obsolete due to its low storage capacity and slow data transfer speed.

18. Which of the following is a disadvantage of magnetic storage devices compared to SSDs?

    a. Lower storage capacity

    b. Higher cost per gigabyte

    c. Slower read/write speeds

    d. Volatile nature

    Answer: c. Slower read/write speeds

    Explanation: Magnetic storage devices, like HDDs, generally have slower read/write speeds compared to SSDs (Solid State Drives). SSDs use flash memory, which allows for faster data access. Magnetic storage devices, however, often offer larger storage capacities at a lower cost per gigabyte.

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19. How does data retrieval from a magnetic tape differ from that of a hard disk drive?

    a. Magnetic tape allows for random access like HDDs

    b. Data on magnetic tape is accessed sequentially

    c. Magnetic tape is faster in data retrieval than HDDs

    d. Magnetic tape uses optical methods for data retrieval

    Answer: b. Data on magnetic tape is accessed sequentially

    Explanation: Magnetic tape storage retrieves data sequentially, meaning the tape must be wound to the correct location before data can be read, which makes it slower compared to the random access capabilities of a Hard Disk Drive (HDD).

20. What does SSD stand for?

    a. Solid Storage Disk

    b. Solid State Drive

    c. Static Storage Device

    d. Serial Storage Drive

    Answer: b. Solid State Drive

    Explanation: SSD stands for Solid State Drive. It is a type of non-volatile storage that uses flash memory to store data, providing faster access speeds compared to traditional hard disk drives (HDDs).

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21. Which type of memory is primarily used in SSDs?

a.DRAM

b. SRAM

c. Flash memory

d. ROM

Answer: c. Flash memory

Explanation: SSDs primarily use flash memory, which is a type of non-volatile memory that retains data even when the power is off. Flash memory provides fast read/write speeds and is highly durable, making it ideal for SSDs.

22. Which of the following best describes the access time of an SSD compared to an HDD?

a. SSDs have slower access times

b. SSDs have the same access times

c. SSDs have faster access times

d. Access time depends solely on the storage capacity

Answer: c. SSDs have faster access times

Explanation: SSDs have significantly faster access times compared to HDDs because they do not rely on spinning disks and moving read/write heads. Data can be accessed almost instantly from any location on the SSD.

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23. Which interface is commonly used by modern SSDs for high-speed data transfer?

a. IDE

b. SATA

c. USB 2.0

d. NVMe

Answer: d. NVMe

Explanation: NVMe (Non-Volatile Memory Express) is a high-speed storage interface specifically designed for SSDs. It offers faster data transfer rates and lower latency compared to older interfaces like SATA and IDE, making it ideal for modern SSDs.

24. Which of the following is NOT a characteristic of SSDs?

a. No moving parts

b. High power consumption

c. Faster boot times

d. Lightweight design

Answer: b. High power consumption

Explanation: SSDs are known for their low power consumption, which is one of their key advantages over HDDs. They consume less energy because they have no moving parts and rely on efficient flash memory.

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25. What is the main disadvantage of SSDs compared to HDDs?

a. Slower data access speed

b. Larger physical size

c. Higher cost per gigabyte

d. Use of mechanical components

Answer: c. Higher cost per gigabyte

Explanation: The main disadvantage of SSDs is their higher cost per gigabyte compared to HDDs. While prices for SSDs have been decreasing, they are still generally more expensive than HDDs for the same amount of storage.

26. Which type of SSD form factor is commonly used in ultrabooks and slim laptops?

a. 3.5-inch SSD

b. 2.5-inch SSD

c. mSATA SSD

d. M.2 SSD

Answer: d. M.2 SSD

Explanation: M.2 SSDs are commonly used in ultrabooks and slim laptops due to their compact size and high performance. The M.2 form factor allows manufacturers to fit high-speed storage into thin devices, offering space efficiency and better performance.

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27. How do SSDs improve system boot times compared to traditional HDDs?

a. By using magnetic platters for data storage

b. By accessing data sequentially

c. By eliminating mechanical delays associated with spinning disks

d. By requiring regular defragmentation

Answer: c. By eliminating mechanical delays associated with spinning disks

Explanation: SSDs improve system boot times by eliminating the mechanical delays associated with spinning disks in HDDs. Since SSDs have no moving parts, they can access data much more quickly, leading to faster boot and load times.

28. Which of the following best describes how data is erased on an SSD?

a. Data is erased by physically damaging the storage cells

b. Data is erased using a high-power magnetic field

c. Data is erased by overwriting with new data

d. Data is erased by clearing the electrical charges in the storage cells

Answer: d. Data is erased by clearing the electrical charges in the storage cells

Explanation: Data on an SSD is erased by clearing the electrical charges in the storage cells of the flash memory. This process resets the cells to their default state, allowing new data to be written.

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29. Which device allows multiple peripherals to connect to a computer using a single port?

    a. Router

    b. USB Hub

    c. Modem

    d. Switch

    Answer: b. USB Hub

    Explanation: A USB Hub is a device that allows multiple USB devices to connect to a single USB port on a computer. It expands the number of available USB ports, enabling users to connect additional peripherals like keyboards, mice, and storage devices.

30. Which port is typically used to connect external storage devices to a computer?

    a. VGA Port

    b. Ethernet Port

    c. USB Port

    d. HDMI Port

    Answer: c. USB Port

    Explanation: USB (Universal Serial Bus) ports are commonly used to connect external storage devices, such as external hard drives, flash drives, and other peripherals, to a computer. USB ports are widely used due to their versatility and ease of use.

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31. What does NAS stand for in the context of data storage?

a. Network Administration System

b. Network Attached Storage

c. Network Access Server

d. Network Authentication Service

Answer: b. Network Attached Storage

Explanation: NAS stands for Network Attached Storage. It is a dedicated file storage device that provides local area network (LAN) users with centralized, consolidated disk storage through a standard Ethernet connection.

32. Which of the following is a primary function of NAS devices?

a. Acting as a firewall

b. Providing network access to storage

c. Managing network traffic

d. Performing data backups only

Answer: b. Providing network access to storage

Explanation: The primary function of NAS devices is to provide network access to storage. NAS devices allow multiple users and devices on a network to access and share the same storage resources.

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33. Which protocol is commonly used by NAS devices to share files over a network?

a. HTTP

b. FTP

c. CIFS/SMB

d. SSH

Answer: c. CIFS/SMB

Explanation: NAS devices commonly use protocols like CIFS (Common Internet File System) and SMB (Server Message Block) to share files over a network. These protocols are particularly common in Windows environments, enabling seamless file sharing between computers.

34. Which of the following is an advantage of using NAS over traditional file servers?

a. Higher cost

b. Complex setup process

c. Easier to manage and set up

d. Limited scalability

Answer: c. Easier to manage and set up

Explanation: NAS devices are typically easier to manage and set up compared to traditional file servers. They come with user-friendly interfaces and are often designed to be plug-and-play, making them accessible even to non-technical users.

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35. Which storage technology is commonly used in NAS devices?

a. Tape Drives

b. SSDs or HDDs

c. Optical Disks

d. Floppy Disks

Answer: b. SSDs or HDDs

Explanation: NAS devices commonly use either SSDs (Solid State Drives) or HDDs (Hard Disk Drives) for storage. These drives provide the necessary capacity and performance to store and serve data to multiple users on a network.

36. Which of the following is a key feature of NAS that allows for data redundancy?

a. Cloud Backup

b. RAID Configuration

c. File Compression

d. Load Balancing

Answer: b. RAID Configuration

Explanation: NAS devices often support RAID (Redundant Array of Independent Disks) configurations, which provide data redundancy and improve reliability. RAID can protect data against drive failures by storing data across multiple disks.

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37. Which type of network connection is typically used to connect a NAS device to a network?

    a. Wi-Fi

    b. USB

    c. Ethernet

    d. Bluetooth

    Answer: c. Ethernet

    Explanation: NAS devices are typically connected to a network using an Ethernet connection. This wired connection provides the necessary bandwidth and reliability for accessing and transferring data across the network.

38. What is a common use case for a NAS device in a home or small office environment?

    a. Hosting websites

    b. File sharing and backup

    c. Running virtual machines

    d. Providing email services

    Answer: b. File sharing and backup

    Explanation: In a home or small office environment, NAS devices are commonly used for file sharing and backup. They provide a centralized location for storing and accessing files, making it easy to share data among multiple users and devices.

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39. Which of the following can be a potential disadvantage of using NAS?

a. High energy consumption

b. High setup complexity

c. Limited access to files over the network

d. Dependence on network performance

Answer: d. Dependence on network performance

Explanation: One potential disadvantage of using NAS is its dependence on network performance. If the network is slow or congested, access to files stored on the NAS can be delayed, affecting overall efficiency.

40. Which of the following features would you expect in a high-end NAS device for business use?

a. Single drive setup

b. No data redundancy

c. Support for multiple RAID levels

d. Limited user management

Answer: c. Support for multiple RAID levels

Explanation: High-end NAS devices designed for business use typically support multiple RAID levels, offering different options for balancing data redundancy, performance, and storage capacity. This feature is crucial for ensuring data protection and system reliability in business environments.

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41. What does SAN stand for in the context of data storage?

a. System Access Network

b. Storage Area Network

c. Secure Access Network

d. Server Attached Network

Answer: b. Storage Area Network

Explanation: SAN stands for Storage Area Network. It is a high-speed network that provides access to consolidated block-level data storage, typically used in enterprise environments to improve storage management and data access performance.

42. Which protocol is commonly used for communication within a SAN?

a. FTP

b. CIFS/SMB

c. Fibre Channel

d. HTTP

Answer: c. Fibre Channel

Explanation: Fibre Channel is a high-speed network technology commonly used for communication within a SAN. It allows for fast, reliable, and secure data transfer between servers and storage devices, making it ideal for enterprise-level storage networks.

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43. What is the primary advantage of using a SAN over direct-attached storage (DAS)?

a. Lower cost

b. Simpler setup

c. Improved scalability and performance

d. Less complex management

Answer: c. Improved scalability and performance

Explanation: The primary advantage of using a SAN over direct-attached storage (DAS) improves scalability and performance. SANs allow for the centralization of storage resources, enabling more efficient storage management, better data access speeds, and easier expansion as storage needs grow.

44. Which of the following is a key feature of a SAN?

a. File-level data storage

b. Block-level data storage

c. Wireless connectivity

d. Integration with web servers

Answer: b. Block-level data storage

Explanation: SANs provide block-level data storage, which is more efficient and flexible for high-performance applications and databases. Unlike NAS, which deals with file-level storage, SANs manage data at the block level, giving operating systems and applications direct access to storage resources.

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45. Which type of network architecture is most commonly associated with SANs?

a. Client-server

b. Peer-to-peer

c. Mesh

d. Fabric

Answer: d. Fabric

Explanation: SANs commonly use a network architecture known as a "fabric," which consists of interconnected switches and storage devices. This architecture allows for multiple paths between devices, enhancing redundancy, performance, and scalability.

46. Which of the following is a common use case for deploying a SAN?

a. Small office file sharing

b. Home media server

c. Enterprise database hosting

d. Personal backup storage

Answer: c. Enterprise database hosting

Explanation: SANs are often deployed in enterprise environments where high-performance, reliable, and scalable storage is needed, such as for hosting large databases, supporting virtualized environments, or managing critical business applications.

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47. Which technology is often used alongside SANs to provide data redundancy and fault tolerance?

a. RAID

b. FTP

c. HTTP

d. NTFS+

Answer: a. RAID

Explanation: RAID (Redundant Array of Independent Disks) technology is often used alongside SANs to provide data redundancy and fault tolerance. RAID configurations help protect against data loss due to hardware failures by storing data across multiple disks.

48. Which of the following components is essential in a SAN environment for managing data storage and access?

a. Switches

b. Routers

c. Modems

d. Firewalls

Answer: a. Switches

Explanation: Switches are essential components in a SAN environment, as they facilitate the connection and communication between storage devices and servers within the network. SAN switches are designed to handle high-speed data transfers and ensure that data is routed efficiently.

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49. What is the main difference between SAN and NAS?

a. SAN uses block-level storage, while NAS uses file-level storage.

b. SAN is cheaper than NAS.

c. NAS requires Fibre Channel, while SAN uses Ethernet.

d. SAN is used for home networks, while NAS is for enterprise use.

Answer: a. SAN uses block-level storage, while NAS uses file-level storage.

Explanation: The main difference between SAN and NAS is that SAN uses block-level storage, which is better suited for high-performance applications and virtualized environments, while NAS uses file-level storage, which is easier to manage and more suitable for general file sharing.

50. Which storage protocol, commonly used in SANs, operates over TCP/IP networks?

a. NFS

b. iSCSI

c. FTP

d. SMB

Answer: b. iSCSI

Explanation: iSCSI (Internet Small Computer Systems Interface) is a storage protocol used in SANs that operate over TCP/IP networks. It allows data to be transferred over existing network infrastructure, making SANs more accessible and cost-effective for organizations that do not use Fibre Channel.

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51. What does RAID stand for?

a. Redundant Array of Independent Disks

b. Reliable Array of Integrated Drives

c. Redundant Allocation of Independent Disks

d. Rapid Array of Integrated Drives

Answer: a. Redundant Array of Independent Disks

Explanation: RAID stands for Redundant Array of Independent Disks. It is a data storage virtualization technology that combines multiple physical disk drive components into one or more logical units to improve data redundancy and performance.

52. Which RAID level provides striping without redundancy?

a. RAID 0

b. RAID 1

c. RAID 5

d. RAID 10

Answer: a. RAID 0

Explanation: RAID 0, also known as striping, provides improved performance by spreading data across multiple disks. However, it does not offer redundancy or data protection, so if one disk fails, all data is lost.

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53. Which RAID level uses mirroring to provide redundancy?

a. RAID 1

b. RAID 2

c. RAID 5

d. RAID 6

Answer: a. RAID 1

Explanation: RAID 1, also known as mirroring, provides redundancy by duplicating the same data across two or more disks. This ensures that if one disk fails, the data is still available on the other disk(s).

54. Which RAID level provides both striping and mirroring?

a. RAID 5

b. RAID 10

c. RAID 0

d. RAID 6

Answer: b. RAID 10

Explanation: RAID 10 (or RAID 1+0) combines both striping (RAID 0) and mirroring (RAID 1). It provides improved performance and redundancy by creating mirrored pairs of disks and then striping data across those pairs.

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55. Which RAID level uses parity for redundancy and requires a minimum of three disks?

a. RAID 1

b. RAID 5

c. RAID 0

d. RAID 6

Answer: b. RAID 5

Explanation: RAID 5 uses distributed parity for redundancy and requires at least three disks. It provides a good balance of performance, data redundancy, and storage efficiency by spreading parity information across all disks in the array.

56. What is the main advantage of RAID 6 over RAID 5?

a. Better performance

b. Higher storage capacity

c. Dual parity protection

d. Easier setup

Answer: c. Dual parity protection

Explanation: RAID 6 provides dual parity protection, which means it can withstand the failure of two disks simultaneously, unlike RAID 5, which can only tolerate a single disk failure. This added redundancy improves data protection but may come with a slight performance cost.

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57. Which RAID level is often used for high-performance databases where both speed and redundancy are required?

a. RAID 0

b. RAID 1

c. RAID 5

d. RAID 10

Answer: d. RAID 10

Explanation: RAID 10 (RAID 1+0) is commonly used for high-performance databases because it combines the performance benefits of striping with the redundancy of mirroring. It offers both high speed and high reliability, making it suitable for critical applications.

58. In which RAID level is data distributed across all disks along with parity information, allowing for data recovery in case of a single disk failure?

a. RAID 0

b. RAID 1

c. RAID 5

d. RAID 10

Answer: c. RAID 5

Explanation: RAID 5 distributes data and parity information across all disks in the array. If a single disk fails, the missing data can be reconstructed using the parity information, allowing for data recovery.

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59. Which RAID level requires an even number of disks and uses data striping with dual parity for increased fault tolerance?

    a. RAID 0

    b. RAID 1

    c. RAID 5

    d. RAID 6

    Answer: d. RAID 6

    Explanation: RAID 6 requires a minimum of four disks and uses dual parity for increased fault tolerance. This allows RAID 6 to withstand the failure of two disks simultaneously, providing higher data protection compared to RAID

60. What is the primary disadvantage of RAID 0?

    a. High cost

    b. Lack of redundancy

    c. High complexity

    d. Limited performance

    Answer: b. Lack of redundancy

    Explanation: The primary disadvantage of RAID 0 is its lack of redundancy. While it provides improved performance by striping data across multiple disks, it does not offer any data protection. If one disk fails, all data in the RAID 0 array is lost.