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CompTIA DS0-001

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Topic Break Down

Topic	No. of Questions
Topic 1, Database Fundamentals	51
Topic 2, Database Deployment	20
Topic 3, Database Management and Maintenance	25
Topic 4, Data and Database Security	36
Topic 5, Business Continuity	14
Topic 6, Mix Questions	2
Total	148

QUESTION NO: 1

A database administrator set up a connection for a SQL Server instance for a new user, but the administrator is unable to connect using the user ' s workstation. Which of the following is the most likely cause of the issue?

A. The SQL Server codes are performing badly.

B. The SQL Server has not been tested properly.

C. The SQL Server ports to the main machine are closed.

D. The SQL Server has many concurrent users.

ANSWER: C

Explanation:

The SQL Server ports to the main machine are closed is the most likely cause because a workstation must be able to reach the SQL Server Database Engine over the network before the new user can establish a database session. SQL Server commonly uses TCP port 1433 for a default instance, while named instances may use dynamically assigned ports or a specifically configured static port. A host-based firewall, network firewall, security group, or other filtering device that blocks the applicable inbound TCP port prevents the client from reaching the instance, regardless of whether the user account and connection configuration were created successfully.

To resolve the issue, the administrator should confirm that the SQL Server service is running and listening on the expected TCP port, then permit inbound traffic to that port from the user workstation or authorized client network. For a named instance using dynamic ports, the administrator may also need to ensure SQL Server Browser access is available over UDP port 1434, or configure and permit a static port instead. Microsoft provides detailed guidance on identifying and opening the required firewall ports for SQL Server in Configure the Windows Firewall to allow SQL Server access and on TCP/IP network configuration in Configure a server to listen on a specific TCP port.

QUESTION NO: 2

(Which of the following types of scripting can be executed on a web browser?)

A. Server-side

B. PowerShell

C. Client-side

D. Command-line

ANSWER: C

Explanation:

Client-side scripting is executed by the user's web browser after the browser receives the web page and its associated resources. JavaScript is the standard and most common example: browsers include JavaScript engines that interpret or compile the script locally, enabling interactive behavior such as responding to user actions, validating form input, changing page content dynamically, and communicating asynchronously with web services. Client-side execution can improve responsiveness because many interface actions can occur without a full page reload or an immediate server request. In database-backed web applications, client-side code commonly presents data and collects user input, while the application's server-side components must still enforce authorization, validation, and data-integrity controls before accessing or modifying database records. This execution boundary is important because code delivered to a browser is visible to and under the control of the user; browser-based validation is useful for usability but is not a security control by itself. The MDN Web Docs guide explains that JavaScript is commonly used to make web pages interactive and runs in browsers through their built-in JavaScript engines: MDN: What is JavaScript?. The Web Hypertext Application Technology Working Group also maintains the HTML standard defining how browsers process script elements: WHATWG HTML—Scripting.

QUESTION NO: 3

A database administrator must grant an application read access to customer order data while preventing the application from changing data or using a shared administrator account.

Which of the following actions support the principle of least privilege? (Choose two.)

A. Create a dedicated service account for the application.

B. Grant SELECT permission only on the required tables or views.

C. Configure the application to use a shared administrator account.

D. Grant database-owner permission to simplify future deployments.

E. Disable auditing for the application account.

ANSWER: A B

Explanation:

Creating a dedicated application service account and granting that account SELECT permission only on the required objects support least privilege. A dedicated identity makes activity auditable and prevents the application from depending on an individual user account. Object-level read permission limits the application to the information needed for its stated function.

Using a shared administrator account gives the application excessive privileges and eliminates accountability. Granting database-owner access allows unnecessary changes. Disabling auditing reduces visibility rather than enforcing access restrictions.

QUESTION NO: 4

A DBA is troubleshooting a database server that has high query latency even though CPU utilization remains low. Monitoring shows that storage response times are elevated and the database engine is waiting for pages to be read from disk.

Which of the following metrics would most directly support the DBA's diagnosis? (Choose two.)

A. Disk I/O latency

B. Read and write operations per second

C. Password-expiration events

D. Number of database schemas

E. CPU utilization

ANSWER: A B

Explanation:

Disk I/O latency and read/write operations per second are the most direct metrics for evaluating a storage bottleneck. High latency indicates that I/O requests are taking too long to complete, while IOPS helps quantify the workload imposed on the storage subsystem. These measurements can be correlated with database wait activity and query latency.

CPU utilization is useful for host monitoring but is already known to be low. Password-expiration events and the number of database schemas do not measure storage performance.

QUESTION NO: 5

A database administrator is updating an organization ' s ERD. Which of the following is the best option for the database administrator to use?

A. Word processor

B. Spreadsheet

C. UML tool

D. HTML editor

ANSWER: C

Explanation:

UML tool is the best choice because it is designed to visually model entities, their attributes, and the relationships between them. An entity-relationship diagram (ERD) documents the logical structure of a database, including tables or entities, columns or attributes, primary keys, foreign keys, and cardinality between related entities. Modeling tools that support Unified Modeling Language (UML), particularly class diagrams, provide a structured visual notation that can represent this information clearly and consistently. They commonly provide diagram templates, relationship connectors, notation controls, validation features, and export capabilities, making it practical for a database administrator to maintain an accurate organizational data model as the schema changes. Although UML is broader than database design alone, UML-based modeling tools are commonly used to depict database entities and their associations, and their visual modeling features directly support ERD maintenance. CompTIA's DataSys+ exam objectives include database design concepts such as entity relationships, normalization, keys, and data modeling, all of which are documented effectively through ERDs. See the Object Management Group UML specification for the standard modeling language and CompTIA's DataSys+ certification page for the certification's database-focused scope.

QUESTION NO: 6

Which of the following have data manipulation and procedural scripting power? (Choose two.)

A. PQL

B. PL/SQL

C. Advanced

D. SQL

E. SQL

F. T-SQL

ANSWER: B F

Explanation:

PL/SQL and T-SQL are SQL dialects that combine standard SQL data-manipulation capabilities with procedural programming constructs. Both can issue data manipulation language statements, such as `INSERT`, `UPDATE`, `DELETE`, and `MERGE`, while also supporting programmatic logic including local variables, conditional branching, loops, error handling, and reusable database code. This combination allows database professionals to place controlled processing logic close to the data and to implement stored procedures, functions, and triggers.

PL/SQL is Oracle Database's procedural extension to SQL. Oracle documents that PL/SQL combines SQL's data-manipulation power with procedural-language functionality and supports program units such as procedures, functions, packages, and triggers. T-SQL is Microsoft SQL Server's programming extension to SQL; it supports control-of-flow language, variables, transactions, and stored-programming constructs alongside SQL statements. Therefore, both technologies meet the requirement for data manipulation and procedural scripting power. See the Oracle PL/SQL documentation and Microsoft Transact-SQL documentation.

QUESTION NO: 7

(Which of the following should a database administrator monitor to ensure a database has enough physical storage available to maintain performance expectations? **Select two**.)

A. Network traffic

B. Disk space

C. Concurrent connections

D. Database size growth

E. CPU usage

F. RAM usage

ANSWER: B D

Explanation:

Disk space and **Database size growth** are the appropriate metrics for ensuring that a database has sufficient physical storage while continuing to meet performance expectations. Monitoring disk space provides the DBA with the current capacity and free-space position of the volumes used by database data files, log files, temporary workspace, backups, and related database operations. Free capacity is needed not just for incoming data, but also for routine operational activity such as index maintenance, transaction-log expansion, sorting, and temporary objects. Tracking this metric lets administrators identify capacity pressure and provision or reclaim storage before writes or maintenance tasks are affected.

Database size growth supports proactive capacity planning. A DBA should measure how quickly database files, indexes, and transaction logs grow over time, then use those trends to forecast future storage requirements. Growth rates can vary with application usage, data-retention policies, batch workloads, and index changes; historical monitoring makes it possible to plan expansion before existing storage becomes constrained. Together, current disk-space monitoring and growth forecasting provide both an immediate view of available physical capacity and an evidence-based estimate of when additional capacity will be needed. Microsoft's guidance on monitoring disk space and database file growth is available in Monitor Disk Space and Manage Filegroups and Files.

QUESTION NO: 8

Which of the following can be used to protect physical database appliances from damage in a server room? (Choose two.)

A. Biometric access systems

B. Database control systems

C. Fire suppression systems

D. Camera systems

E. Key card systems

F. Cooling systems

ANSWER: C F

Explanation:

Fire suppression systems and **cooling systems** protect database appliances against major environmental hazards within a server room. Fire suppression detects a fire condition and uses an appropriate suppression agent to contain or extinguish it before heat, smoke, and flames can damage servers, storage arrays, network equipment, and their supporting infrastructure. Data-center fire protection is commonly designed around early detection and suppression methods suitable for occupied technology spaces.

Cooling systems maintain the environmental operating conditions required by physical hardware. Server processors, memory, disks, power supplies, and networking components generate substantial heat; sustained temperatures outside manufacturer limits can cause reduced performance, hardware faults, shortened component life, or abrupt shutdowns.

Cooling equipment also works with environmental monitoring and airflow design to maintain appropriate temperature and humidity conditions. These controls are directly aligned with the physical and environmental protections that support availability and disaster-recovery readiness for database systems.

CompTIA identifies business continuity and disaster recovery as a DataSys+ domain, including the implementation of appropriate recovery methods and controls. See the CompTIA DataSys+ certification page and the NIST guidance on systems security engineering, which addresses protecting systems from environmental and physical hazards.

QUESTION NO: 9

(A database administrator wants to create a database that does not have a predefined schema. Which of the following tools should the administrator use to create this type of database? **Select two** .)

A. PostgreSQL

B. MariaDB

C. MySQL

D. SQL Server

E. MongoDB

F. Cosmos

ANSWER: E F

Explanation:

MongoDB and Azure Cosmos DB are appropriate tools when the requirement is to avoid a rigid, predefined relational schema. MongoDB is a document-oriented NoSQL database. It stores records as BSON documents in collections, allowing documents in the same collection to contain different fields and structures as application data evolves. MongoDB describes this as a flexible data model, which is useful for semi-structured data and workloads whose attributes can change over time. See the MongoDB data-modeling documentation.

Cosmos refers to Azure Cosmos DB, Microsoft's globally distributed NoSQL database service. Its document-oriented APIs, such as the Azure Cosmos DB for NoSQL API and API for MongoDB, permit items to have varying properties without requiring a fixed table definition or identical set of columns for every record. This schema flexibility supports applications that ingest JSON-like data and need to adjust their data shape without performing relational table schema migrations. Azure Cosmos DB also provides managed horizontal scaling and global distribution, making it suitable for flexible-schema cloud workloads. Microsoft describes its service and supported NoSQL data model in the Azure Cosmos DB overview.

Therefore, MongoDB and Cosmos are the two selections that meet the stated need for a database without a predefined schema.

QUESTION NO: 10

A database administrator is new to a company and wants to create a document that illustrates the interaction between tables. Which of the following should the administrator create?

A. Troubleshooting guide

B. Entity relationship diagram

C. Data dictionary

D. Database reference manual

ANSWER: B

Explanation:

Entity relationship diagram is the correct document because it visually models the logical structure of a database and, most importantly here, the relationships between its tables. An ERD represents entities, which commonly map to tables, along with their attributes, which commonly map to columns. It also shows how records in one table relate to records in another through relationship connectors, cardinality notation, and often primary-key and foreign-key fields. For example, an ERD can show that one customer can be associated with many orders, while each order is associated with one customer. This lets a new database administrator quickly understand dependencies, expected data relationships, and the intended design before making changes or writing queries. ERDs are used during database design as well as for documenting an existing schema, making them particularly useful for onboarding and ongoing database administration. Microsoft's database-design guidance describes relationships as the associations established between tables using matching fields, typically primary and foreign keys. Lucidchart also provides an overview of ERDs and their role in depicting entities and the relationships among them. See Microsoft Support: Guide to table relationships and Lucidchart: Entity relationship diagrams.

QUESTION NO: 11

A database administrator is reviewing a planned migration of a production database to a new host. The migration window permits only a short interruption, and the administrator must be able to return to the original environment if validation fails.

Which of the following should be included in the migration plan? (Choose two.)

A. Document a rollback procedure for returning to the original environment.

B. Validate application connectivity and service-account access after the move.

C. Delete the original database immediately after the data copy completes.

D. Grant all application accounts administrative permissions on the new host.

E. Defer migration validation until the next business day.

ANSWER: A B

Explanation:

A documented rollback procedure and validation of application connectivity after the move are essential migration-plan components. The rollback procedure defines how service will be returned to the original environment if the new host fails validation. Application-connectivity validation confirms that dependent systems can resolve the new host, authenticate, and access required database objects.

Deleting the original database before validation removes the recovery option. Changing production permissions during the migration increases risk unless it is a controlled requirement. Deferring all validation until the next business day extends the outage and prevents timely rollback.

QUESTION NO: 12

Which of the following computer services associates IP network addresses with text-based names in order to facilitate identification and connectivity?

A. LDAP

B. NTP

C. DHCP

D. DNS

ANSWER: D

Explanation:

DNS is the service that maps human-readable, text-based domain names to IP addresses, enabling users and applications to locate hosts and services on IP networks without needing to use numeric addresses directly. For example, when a user

enters a name such as *www.comptia.org*, a DNS resolver queries the DNS hierarchy to obtain an address record for that name and then uses the returned IP address to establish network connectivity. DNS can also provide reverse lookups, where an IP address is associated with a corresponding domain name through pointer records. This name-to-address resolution is a fundamental network service because names are easier for people to recognize, remember, and manage, while IP addresses provide the routable endpoint information required for communications. DNS records can additionally identify mail servers, service endpoints, aliases, and other information needed for reliable service discovery. The Internet Engineering Task Force defines the DNS concepts and facilities in RFC 1034, while the Internet Assigned Numbers Authority maintains the root zone that supports the global DNS hierarchy at IANA Root Zone Management.

QUESTION NO: 13

(A healthcare company relies on contact forms and surveys on its website to properly communicate with patients. To which of the following attacks is the companyâ€™s data most vulnerable?)

A. DoS

B. Ransomware

C. SQL injection

D. Brute-force

ANSWER: C

Explanation:

SQL injection is the most relevant risk because website contact forms and surveys accept untrusted input that may be passed to an application's database layer. If the application constructs SQL commands by concatenating form values into a query rather than treating those values strictly as data, an attacker can submit specially crafted input that changes the query's intended logic. This can expose, alter, or delete sensitive records. For a healthcare organization, the impact can be especially serious because patient and survey data may include protected health information, making confidentiality and integrity essential.

Secure database-backed web applications mitigate this risk by using parameterized queries (prepared statements), which keep SQL code separate from user-supplied values. Input validation, appropriate error handling, and least-privilege permissions for the application's database account provide additional layers of protection. The OWASP SQL Injection Prevention Cheat Sheet identifies parameterized queries as the primary defense and explains that dynamic queries must not allow user input to alter SQL syntax. OWASP also describes injection as occurring when untrusted data is sent to an interpreter as part of a command or query. See the OWASP SQL Injection Prevention Cheat Sheet and the OWASP SQL Injection overview.

QUESTION NO: 14

An inventory table contains the following columns: ProductID, ProductName, SupplierID, SupplierName, and SupplierPhone. A supplier changes its phone number, and the administrator must update hundreds of product rows for that supplier.

Which of the following design changes would best reduce this update anomaly?

A. Create a separate Supplier table and reference it with SupplierID.

B. Create an index on SupplierPhone.

C. Create a view that displays supplier information.

D. Denormalize the inventory table by adding more supplier columns.

ANSWER: A

Explanation:

Creating a separate Supplier table and storing SupplierID as a foreign key in the inventory table best reduces the update anomaly. SupplierName and SupplierPhone describe the supplier, not an individual product, so they should be maintained once in a Supplier entity. The inventory records can reference that entity through SupplierID.

Adding an index may improve lookup performance but does not remove duplicated supplier data. A view changes how data is presented, not how it is stored. Denormalizing the table would retain or increase redundant data.