

Practice Quiz

Q1: What is Data?

- A) Data is a collection of raw, unorganized facts and details like text, observations, figures, symbols, and descriptions of things.
- B) Data can be recorded and doesn't have any meaning unless processed.
- C) Data is measured in terms of bits and bytes.
- D) Data is organized and structured information.

Answer: A

Explanation: Data is a collection of raw, unorganized facts and details that do not carry any specific purpose or significance by themselves.

Q2: What is Information?

- A) Information is processed, organized, and structured data.
- B) Information provides context to the data and enables decision making.
- C) Information is extracted from data by analyzing and interpreting pieces of data.
- D) Information is raw, unorganized facts.

Answer: A

Explanation: Information is the processed, organized, and structured form of data that provides context and enables decision making.

Q3: What is a Database?

- A) Database is an electronic place/system where data is stored and easily accessed, managed, and updated.
- B) Database is a collection of random data.
- C) Database is a physical storage device.
- D) Database is a type of software.

Answer: A

Explanation: A database is an electronic system where data is stored in a way that it can be easily accessed, managed, and updated.

Q4: What is a DBMS?

A) A DBMS is a collection of interrelated data and a set of programs to access those data.

B) A DBMS is the database itself, along with all the software and functionality.

C) A DBMS is a type of data.

D) A DBMS is a programming language.

Answer: A

Explanation: A DBMS is a collection of interrelated data and a set of programs to access that data, providing a way to store and retrieve information conveniently and efficiently.

Q1: What is the purpose of Specialisation in database design?

A) To group entities based on common attributes

B) To show distinctive features of sub entities

C) To create relationships among relationships

D) To avoid redundancy in data

Answer: B) To show distinctive features of sub entities

Explanation: Specialisation is used in database design to highlight the unique attributes and characteristics of sub entities within a superclass.

Q1: What SQL keyword is used to reduce rows based on given conditions?

A) AND

B) OR

C) WHERE

D) NOT

Answer: C) WHERE

Explanation: The WHERE keyword is used in SQL to filter rows based on specified conditions.

Q1: What is the main purpose of normalisation in a database?

- A) To increase data redundancy
- B) To decrease database organisation
- C) To maintain data consistency
- D) To slow down query performance

Answer: C

Explanation: Normalisation helps to maintain data consistency in a database by reducing data redundancy and improving overall database organisation.

Q2: What is the primary requirement for a relation to be in 1NF?

- A) Every relation cell must have atomic value
- B) Relation must have multi-valued attributes
- C) Partial dependency is allowed
- D) Transitivity dependency is allowed

Answer: A

Explanation: In 1NF, every relation cell must have an atomic value, meaning it cannot contain multiple values or be divided further.

Q3: What is the key characteristic of BCNF (Boyce-Codd normal form)?

- A) Relation must have transitivity dependency
- B) FD: $A \rightarrow B$, A must be a super key

C) Non-prime attribute should find a non-prime attribute

D) Partial dependency is allowed

Answer: B

Explanation: In BCNF, the functional dependency $A \rightarrow B$ requires that A must be a super key, ensuring that prime attributes are not derived from non-prime attributes.

Q4: Which property of a transaction ensures that either all operations are reflected properly in the database, or none are?

A) Atomicity

B) Consistency

C) Isolation

D) Durability

Answer: A

Explanation: Atomicity in a transaction ensures that either all operations are completed successfully and reflected in the database, or none of them are, to maintain data integrity.

Q5: What is the main advantage of indexing in a database?

A) Slower access and retrieval of data

B) Increased performance in INSERT, DELETE, and UPDATE queries

C) Faster access and retrieval of data

D) Decreased IO operations

Answer: C

Explanation: Indexing optimizes the performance of a database by minimizing the number of disk accesses required, resulting in faster access and retrieval of data.

Q1: What is a key-value store in NoSQL databases?

A) Stores data in tables with fixed rows and columns

B) Stores data in documents similar to JSON objects

C) Stores data as key-value pairs

D) Stores data in a graph structure

Answer: C) Stores data as key-value pairs

Explanation: A key-value store in NoSQL databases stores data as a key value pair consisting of an attribute name (key) and a value.

Q2: Which type of NoSQL database is suitable for real-time random data access?

A) Key-Value Stores

B) Column-Oriented

C) Document Based Stores

D) Graph Based Stores

Answer: A) Key-Value Stores

Explanation: Key-Value Stores are optimal for real-time random data access, such as user session attributes in online applications like gaming or finance.

Q3: What is a disadvantage of NoSQL databases?

A) Data redundancy

B) Support for ACID transactions

C) Update & Delete operations are costly

D) ACID properties are supported

Answer: C) Update & Delete operations are costly

Explanation: Update and delete operations in NoSQL databases can be costly compared to SQL databases.

Q4: Which type of database is based on the object-oriented programming paradigm?

- A) Relational Databases
- B) Object Oriented Databases
- C) NoSQL Databases
- D) Hierarchical Databases

Answer: B) Object Oriented Databases

Explanation: Object Oriented Databases are based on the object-oriented programming paradigm, treating data as objects with inheritance and encapsulation.

Q5: What is the primary purpose of NoSQL databases?

- A) General Purpose
- B) Large amounts of data with simple lookup queries
- C) Analyzing and traversing relationships between connected data
- D) Storing data in tables with fixed rows and columns

Answer: B) Large amounts of data with simple lookup queries

Explanation: NoSQL databases are suitable for storing large amounts of data with simple lookup queries, providing flexible schemas and scalability.

Q1: What is the purpose of load balancing in a database system?

- A) To slow down traffic
- B) To speed up traffic
- C) To evenly distribute traffic across multiple machines
- D) To shut down individual machines

Answer: C

Explanation: Load balancing helps evenly distribute traffic across multiple machines to prevent overworking any single machine and ensure high availability.

Q2: Which technique divides stored database objects into separate servers for increased performance and controllability of data?

- A) Clustering
- B) Sharding
- C) Partitioning
- D) Distributed Database

Answer: C

Explanation: Partitioning divides database objects into separate servers, leading to increased performance and better control over data.

Q3: What is the fundamental idea behind Sharding in database systems?

- A) To have all data sit on one DB instance
- B) To spread data across multiple DB instances
- C) To introduce a routing layer for data access
- D) To decrease system complexity

Answer: B

Explanation: Sharding involves splitting up data across multiple DB instances and introducing a routing layer for accessing the data, leading to scalability and availability.

Q4: When is partitioning applied in a database system?

- A) When system response time is low
- B) When managing and dealing with data becomes tedious
- C) When there are few requests to the DB server
- D) When the database is small

Answer: B

Explanation: Partitioning is applied when managing and dealing with data becomes tedious due to its size, making it necessary to divide it into smaller partitions for easier management.

Q1: What is the CAP theorem about?

- A) Consistency, Availability, and Performance
- B) Consistency, Availability, and Partition Tolerance
- C) Consistency, Partition Tolerance, and Fault Tolerance
- D) Availability, Performance, and Fault Tolerance

Answer: B

Explanation: The CAP theorem states that a distributed system can only provide two of three properties simultaneously: consistency, availability, and partition tolerance.

Q2: Which database type enables consistency and availability, but not fault tolerance?

- A) CA Databases
- B) CP Databases
- C) AP Databases
- D) NoSQL Databases

Answer: A

Explanation: CA databases enable consistency and availability across all nodes, but they can't deliver fault tolerance.

Q3: What is the purpose of Master-Slave database architecture?

- A) To distribute write requests to multiple nodes
- B) To ensure eventual consistency in a distributed system
- C) To optimize IO in a system with high request volume
- D) To enable horizontal scaling in a database system

Answer: C

Explanation: Master-Slave architecture helps optimize IO in a system with high request volume by directing write operations to the Master DB and reading operations to Slave DBs.