1. What is the primary purpose of concurrency control in database management systems?

a) To ensure consistency and isolation of transactions
b) To maximize throughput and minimize response time
c) To reduce the storage overhead of the database
d) To simplify data retrieval operations

Explanation: Concurrency control aims to maintain the consistency of the database by ensuring that transactions execute in isolation without interfering with each other, thus preventing data corruption or inconsistency.

2. Which of the following locking techniques is known for its simplicity and ease of implementation?

a) Two-Phase Locking (2PL)
b) Timestamp-based protocol
c) Optimistic concurrency control
d) Granular locking

Explanation: Two-Phase Locking (2PL) is known for its simplicity and ease of implementation, making it widely used in database systems.

3. What does a timestamp-based concurrency control protocol use to determine the order of transactions?

a) Unique identifiers assigned to each transaction
b) Timestamps assigned to each transaction
c) Locks acquired by each transaction

d) Granularity levels of the data items

Explanation: Timestamp-based concurrency control protocol uses timestamps assigned to each transaction to determine the order in which transactions are allowed to execute.

4. Which concurrency control protocol employs a ‘read-before-write’ policy to ensure data consistency?

a) Validation-based protocol
b) Two-Phase Locking (2PL)
c) Multi-version concurrency control
d) Timestamp-based protocol

Explanation: Validation-based protocol employs a ‘read-before-write’ policy to ensure data consistency by checking the validity of transactions before allowing them to commit.

5. What is the primary advantage of using multi-version concurrency control (MVCC) over other concurrency control techniques?

a) Reduced contention for locks
b) Simplicity in implementation
c) Better support for distributed databases
d) Faster transaction processing

Explanation: MVCC reduces contention for locks by allowing multiple versions of a data item to exist concurrently, thus enabling read and write operations to proceed without blocking each other.

6. In recovery with concurrent transactions, which mechanism is used to ensure that a database can be restored to a consistent state after a system failure?

a) Checkpoints
b) Locking
c) Timestamps
d) Rollback

Explanation: Checkpoints are used in recovery with concurrent transactions to create stable points in the transaction log, allowing the database to be restored to a consistent state after a system failure.

7. What is a key characteristic of distributed databases compared to centralized databases?

a) Higher scalability
b) Lower complexity
c) Faster data access
d) Reduced redundancy

Explanation: Distributed databases offer higher scalability compared to centralized databases, as they can distribute data across multiple nodes, enabling them to handle larger volumes of data and support more users.

8. Which database technology focuses on extracting patterns and knowledge from large datasets?

a) Data mining
b) Object technology

c) Data warehousing
d) Multimedia databases

Explanation: Data mining focuses on extracting patterns and knowledge from large datasets by using techniques such as machine learning, statistics, and database systems.

9. What is the primary purpose of a data warehouse?

a) To store real-time transactional data
b) To support online transaction processing (OLTP)
c) To provide a centralized repository of integrated data
d) To manage multimedia content

Explanation: The primary purpose of a data warehouse is to provide a centralized repository of integrated data from multiple sources, which can be used for analysis and decision-making purposes.

10. Which database model is specifically designed to handle complex data types and relationships found in multimedia applications?

a) Temporal databases
b) Deductive databases
c) Multimedia databases
d) Web databases

Explanation: Multimedia databases are specifically designed to handle complex data types and relationships found in multimedia applications, such as images, videos, and audio files.

11. What distinguishes object-oriented database management systems (OODBMS) from traditional relational database management systems (RDBMS)?

a) OODBMS support object-oriented concepts such as inheritance and polymorphism
b) RDBMS support distributed data storage
c) OODBMS use SQL as the query language
d) RDBMS offer better performance for complex queries

Explanation: OODBMS support object-oriented concepts such as inheritance and polymorphism, allowing developers to model real-world entities more naturally compared to RDBMS.

12. Which type of database focuses on managing data with time-related aspects, such as valid time and transaction time?

a) Temporal databases
b) Multimedia databases
c) Deductive databases
d) Web databases

Explanation: Temporal databases focus on managing data with time-related aspects, such as valid time (when a fact is true in the real world) and transaction time (when a fact is recorded in the database).

13. What is a characteristic feature of deductive databases?

a) They primarily use SQL for querying
b) They support complex data types

c) They utilize logical rules and inference
d) They are optimized for multimedia content

Explanation: Deductive databases utilize logical rules and inference to derive new information from existing data, allowing for automated reasoning and knowledge discovery.

14. What distinguishes web databases from traditional databases?

a) Web databases are optimized for offline data processing
b) Web databases support distributed data storage
c) Web databases are designed for storing multimedia content
d) Web databases provide interfaces for accessing data over the internet

Explanation: Web databases provide interfaces for accessing data over the internet, allowing users to interact with and retrieve information using web browsers or web applications.

15. Which type of database is specifically tailored to handle data accessed and manipulated by mobile devices?

a) Temporal databases
b) Multimedia databases
c) Web databases
d) Mobile databases

Explanation: Mobile databases are specifically tailored to handle data accessed and manipulated by mobile devices, ensuring efficient storage, retrieval, and synchronization of data between the device and backend servers.

16. Which technique is commonly used in temporal databases to manage changes to data over time?

a) Versioning
b) Locking
c) Timestamping
d) Deduplication

Explanation: Timestamping is commonly used in temporal databases to manage changes to data over time, allowing the system to track when data was modified or accessed.

17. What is the primary focus of multimedia databases?

a) Storing and managing text-based information
b) Handling images, audio, video, and other multimedia content
c) Supporting transactions and concurrency control
d) Enabling complex queries and analytics

Explanation: Multimedia databases focus on handling images, audio, video, and other multimedia content, providing storage, retrieval, and management capabilities tailored to such data types.

18. Which database technology is specifically designed to support the storage and retrieval of data over the internet?

a) Temporal databases
b) Multimedia databases
c) Web databases

d) Mobile databases

Explanation: Web databases are specifically designed to support the storage and retrieval of data over the internet, providing interfaces and protocols for accessing data through web browsers or web services.

19. What distinguishes mobile databases from traditional databases?

a) Mobile databases are optimized for high-performance computing
b) Mobile databases support distributed data storage
c) Mobile databases provide offline data access and synchronization
d) Mobile databases are designed for managing multimedia content

Explanation: Mobile databases provide offline data access and synchronization features

, allowing mobile devices to access and manipulate data even when offline, and synchronize changes with backend servers when connectivity is restored.

20. Which database technology focuses on storing and managing data with logical rules and inference capabilities?

a) Temporal databases
b) Deductive databases
c) Multimedia databases
d) Web databases

Explanation: Deductive databases focus on storing and managing data with logical rules and inference capabilities, allowing for automated reasoning and knowledge discovery based on

the stored data and rules.

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