Database 2

Multiple Choice Questions Based on the Image

Transaction Processing

1. **What is the difference between a single-user system and a multi-user system?**
    - A. Single-user systems can only be accessed by one user at a time, while multi-user systems can be accessed by multiple users simultaneously.
    - B. Single-user systems are typically installed on a single computer, while multi-user systems are typically installed on a network server.
    - C. Single-user systems are used for personal tasks, while multi-user systems are used for business applications.
    - D. All of the above.
2. **What are the two main types of concurrency control mechanisms?**
    - A. Serialization and parallelism
    - B. Locking and timestamping
    - C. Optimistic and pessimistic
    - D. Interleaved and parallel

Interleaved Processing

3. **What is the difference between interleaved processing and parallel processing?**
    - A. Interleaved processing executes transactions one after the other, while parallel processing executes transactions simultaneously.
    - B. Interleaved processing is used in single-user systems, while parallel processing is used in multi-user systems.
    - C. Interleaved processing is more efficient than parallel processing.
    - D. None of the above.
4. **What is the main disadvantage of interleaved processing?**
    - A. It can lead to long wait times for transactions.
    - B. It is difficult to implement.
    - C. It is not suitable for real-time applications.
    - D. It can cause data inconsistencies.

Parallel Processing

5. **What is the main advantage of parallel processing?**

- A. It can improve system performance.
- B. It is easier to implement than interleaved processing.
- C. It is suitable for all types of applications.
- D. It eliminates the need for concurrency control.

6. **What is the main disadvantage of parallel processing?**
   - A. It can be difficult to coordinate multiple transactions.
   - B. It can lead to data inconsistencies.
   - C. It is not suitable for real-time applications.
   - D. It is less efficient than interleaved processing.

Importance of Concurrency Control

7. **What is the purpose of concurrency control?**
   - A. To prevent data inconsistencies.
   - B. To improve system performance.
   - C. To ensure that transactions are executed in the correct order.
   - D. All of the above.
8. **What are the three main concurrency control problems?**
   - A. Lost update, dirty read, and unrepeatable read.
   - B. Deadlock, livelock, and starvation.
   - C. Serialization, parallelism, and interleaving.
   - D. None of the above.

Multiple Choice Questions on the Lost Update Problem

Understanding the Lost Update Problem

1. **What is the primary cause of the lost update problem in database transactions?**
   - A. Incorrect data types
   - B. Lack of indexing
   - C. Interleaved execution of transactions
   - D. Insufficient storage space
2. **When does a lost update occur?**
   - A. When two transactions read the same data item, modify it, and then write the modified value back to the database without proper synchronization.

- B. When a transaction is aborted due to a system failure.
- C. When a transaction is rolled back due to an error.
- D. When a transaction is executed in isolation.

Consequences of Lost Updates

3. **What is the main consequence of the lost update problem?**
   - A. Data corruption
   - B. Increased system performance
   - C. Reduced transaction throughput
   - D. Improved data consistency
4. **Why is the lost update problem considered a serious issue in database systems?**
   - A. It can lead to financial losses.
   - B. It can damage the reputation of the organization.
   - C. It can disrupt business operations.
   - D. All of the above.

Preventing Lost Updates

5. **Which concurrency control mechanism can help prevent lost updates?**
   - A. Two-phase locking
   - B. Timestamping
   - C. Optimistic concurrency control
   - D. All of the above
6. **How does two-phase locking prevent lost updates?**
   - A. By ensuring that transactions acquire all necessary locks before modifying data.
   - B. By assigning timestamps to transactions and using them to determine the order of execution.
   - C. By allowing transactions to modify data without acquiring locks.
   - D. By using a versioning mechanism.

Additional Considerations

7. **What is the difference between a lost update and a dirty read?**
   - A. A lost update occurs when two transactions modify the same data item without proper synchronization, while a dirty read occurs when a transaction reads a value that has not yet been committed.

- B. A lost update occurs when a transaction is rolled back due to an error, while a dirty read occurs when a transaction is aborted due to a system failure.
- C. A lost update occurs when a transaction is executed in isolation, while a dirty read occurs when a transaction is executed in parallel.
- D. There is no difference between a lost update and a dirty read.

8. **How can the lost update problem be further mitigated?**
   - A. By using appropriate data types.
   - B. By indexing frequently accessed data.
   - C. By optimizing database queries.
   - D. All of the above.

9 . is typically installed on a network server and can be accessed by users who are logged in to the network?

- *Single user system*
- *Multi user system*

10 .is typically installed on a single computer and can only be accessed by the user who installed it or the user who is currently logged in.

- *Single user system*
- *Multi user system*

11. …. can be accessed by multiple users simultaneously?

- Single user system
- Multi user system

12. is a process in which the tasks are divided into small sub-tasks that are processing simultaneously or parallel.

- ***Interleaved processing***
- ***Parallel processing***

13. .is a process in which more than one task is being processed at the same time?

- ***Interleaved processing***
- ***Parallel processing***

14. is the logical unit of database processing that includes one or more database access operations?

- ***Transaction***
- ***DBMS***
- ***Recovery manager***

15. ***.... is the atomic unit of work that is either completed in its entirety or not done at all?***

- ***Transaction***
- ***Recovery manager***
- ***DBMS***
- ***System log***

16. In the application program it may contain several transactions separated by transaction boundaries?

- ***True***
- ***false***

17.In Importance of Concurrency Control, ... occurs when a transaction T reads the same item twice and the item is changed by another transaction T between the two reads. Hence, T receives different values for its two reads of the same item?

- The lost update.
- The temporary update (Dirty read).
- The incorrect summary problem.
- The unrepeatable read problem

18. In Importance of Concurrency Control, ... occurs when two transactions that access the same database items have their operations interleaved in a way that makes the value of some database items incorrect?

• The lost update.

• The temporary update (Dirty read).

• The incorrect summary problem.

• The unrepeatable read problem

19. In Importance of Concurrency Control, ... occurs if one transaction is calculating an aggregate summary function on a number of database items while other transactions are updating some of these items.

• ***The lost update.***

• ***The incorrect summary problem.***

• ***The temporary update (Dirty read).***

• ***The unrepeatable read problem***

20. In Importance of Concurrency Control, ... occurs when one transaction updates a database item and then the transaction fails for some reason. Meanwhile, the updated item is accessed (read) by another transaction before it is changed back to its value.

• ***The lost update.***

• ***The temporary update (Dirty read).***

• ***The incorrect summary problem.***

• ***The unrepeatable read problem***

21. in Importance of Recovery, All the operations in the transaction are completed successfully and their value is recorded permanently in the database?

- *True*
- *False*

22. in Importance of Recovery, All the operations in the transaction are completed successfully and their value is recorded permanently in the database?

- *Disk failure*
- *Local errors*
- *Computer failure*

23. One of the reseons for transaction failure, …. means data for the transaction may not be found?

- *Computer failure*
- *Local errors*
- *Disk failure*

24. One of the reseons for transaction failure, …. means If the hardware crashes, the contents of the computer's internal memory may be lost?

- *Local errors*
- *Computer failure*
- *Disk failure*

25. One of the reseons for transaction failure, …. means erroneous parameter values or a logical programming error?

- *Local errors*
- *Computer failure*
- *Transaction or system error*

26. keeps track of all transaction operations that affect the values of database items?

- *SYSTEM LOG*
- *Recovery manager*

27. At this point it may be necessary to check whether the changes introduced by the transaction can be permanently applied to the database or whether the transaction has to be aborted because it violates concurrency control or for some other reason?

- ***Begin-transaction***
- ***Read or Write***
- ***End-transaction***

28. This signals a successful end of the transaction so that any changes (updates) executed by the transaction can be safely committed to the database and will not be undone?

- ***Begin-transaction***
- ***Read or Write***
- ***Commit-transaction***

29. This specifies that read and write transaction operations have ended and marks the end limit of transaction execution?

- ***Begin-transaction***
- ***Read or Write***
- ***End-transaction***

..30. This signals that the transaction has ended unsuccessfully, so that any changes or effects that the transaction may have applied to the database must be undone?

- ***Begin-transaction***
- ***Read or Write***
- ***Rollback (Abort)***

31. ACID stand for all of the following expect

- ***Atomicity***
- ***Consistency preservation***
- ***Isolation***
- ***Durability (permanency)***
- ***None of the bove***

32. In ACID properties, …. means once a transaction changes the database and the changes are committed, these changes must never be lost because of subsequent failure?

- ***Atomicity***
- ***Consistency preservation***
- ***Isolation***
- ***Durability (permanency)***

33. In ACID properties, …. means A correct execution of the transaction must take the database from one consistent state to another?

- ***Atomicity***
- ***Consistency preservation***
- ***Isolation***
- ***transaction schedule or history***

34..in ACID properties, …. means A transaction is an atomic unit of processing; it is either performed in its entirety or not performed at all?

- ***Atomicity***
- ***Consistency preservation***
- ***Isolation***

35. In ACID properties, …. means A transaction should not make its updates visible to other transactions until it is committed?

- ***Atomicity***
- ***Consistency preservation***
- ***Isolation***
- ***Durability (permanency)***

36. In it every transaction reads only the items that are written by committed transactions?

Recoverable schedule

Cascadeless schedule

Strict schedule

Schedules requiring cascaded rollback

37. A schedule in which a transaction can neither read nor write an item X until the last transaction that wrote X has committed?

Recoverable schedule

Cascadeless schedule

Schedules requiring cascaded rollback

38. conflict occurs if two operations satisfy with?

- ***They belong to different transactions***
- ***. They access the same item X***
- ***. At least one of the operation is write_item(X)***
- ***All of the above***

39. A less restrictive definition of equivalence of schedules?

- View equivalence schedule
- View serializability schedule

40. Definition of serializability based on view equivalence?

- View serializability schedule
- View equivalence schedule