✅ Unit-VI: Normalization, Concurrency Control, Recovery & Security – PYQ-Based MCQs (1–30)

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1. Which of the following is not a normal form?
A) 1NF
B) 2NF
C) 4NF
D) 6NF
Answer: D

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2. Functional Dependency is a relationship between:
A) Rows
B) Attributes
C) Tables
D) Keys
Answer: B

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3. A relation is in 1NF if:
A) It has a primary key
B) It has atomic values
C) It has no transitive dependency
D) It has foreign key
Answer: B

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4. A table is in 2NF if:
A) It is in 1NF and all non-key attributes are fully dependent on the primary key
B) It has no repeating groups
C) It has a foreign key
D) It contains composite attributes
Answer: A

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5. Which of the following removes transitive dependency?
A) 1NF
B) 2NF
C) 3NF
D) BCNF
Answer: C

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6. BCNF is a stronger version of:
A) 1NF
B) 2NF
C) 3NF
D) 4NF
Answer: C

7. Which of the following is not a type of functional dependency?
A) Full
B) Partial
C) Transitive
D) Relational
Answer: D

8. Which of the following is used to represent a transaction in DBMS?
A) BEGIN–COMMIT
B) START–END
C) BEGIN–END
D) START–COMMIT
Answer: A

9. The property of transactions where results remain consistent is called:
A) Atomicity
B) Consistency
C) Durability
D) Isolation
Answer: B

10. In ACID properties, atomicity refers to:
A) Transactions are indivisible
B) All data is visible
C) Data is available to all
D) Queries are atomic
Answer: A

11. Durability ensures that:
A) Transactions are lost after a crash
B) Committed transactions survive failures
C) Data is automatically deleted
D) Uncommitted changes are retained
Answer: B

12. Lost update problem occurs due to lack of:
A) Durability
B) Isolation
C) Security
D) Redundancy
Answer: B

13. Which of the following protocols is used for concurrency control?
A) Two-Phase Locking
B) Write-Ahead Logging
C) Redo-Log
D) Shadow Paging
Answer: A

14. A lock that prevents any other transaction from accessing the same data is called:
A) Shared lock
B) Exclusive lock
C) Read lock
D) Implicit lock
Answer: B

15. Which of the following ensures no deadlocks occur?
A) Timeout
B) Wait-die scheme
C) Deadlock detection
D) All of the above
Answer: D

16. A transaction that does not complete its execution is called:
A) Committed
B) Rolled back
C) Aborted
D) Dirty
Answer: C

17. When two transactions read and write data at the same time, it causes:
A) Phantom read
B) Lost update
C) Deadlock

D) Rollback
Answer: B

18. **What is the main purpose of concurrency control?**
A) Avoid data loss
B) Allow parallel processing
C) Maintain database consistency
D) Improve performance
Answer: C

19. **In 2PL protocol, when can a transaction release locks?**
A) Anytime
B) Only after it has acquired all locks
C) After read operation
D) After abort
Answer: B

20. **Recovery technique which maintains undo and redo logs is:**
A) Deferred update
B) Immediate update
C) Shadow paging
D) Checkpointing
Answer: B

21. **What does a checkpoint do in recovery?**
A) Deletes all logs
B) Writes dirty buffers to disk
C) Starts transactions
D) Reverses changes
Answer: B

22. **In SQL, GRANT and REVOKE are used for:**
A) Normalization
B) Recovery
C) Transaction control
D) Authorization
Answer: D

23. Which of the following is a valid schedule in transaction processing?
A) Conflicting
B) Non-serializable
C) Serializable
D) Inconsistent
Answer: C

24. The process of ensuring only authorized users access data is:
A) Durability
B) Normalization
C) Authorization
D) Commit control
Answer: C

25. Which type of attack does DBMS prevent with authorization?
A) Denial-of-service
B) SQL injection
C) Unauthorized data access
D) Packet sniffing
Answer: C

26. The security mechanism that restricts access based on user roles is:
A) RBAC
B) MAC
C) DAC
D) TCB
Answer: A

27. Transaction is considered atomic when it:
A) Can be divided into sub-transactions
B) Is not visible to others
C) All its operations are done or none
D) Is dependent on another
Answer: C

28. Which ACID property is most affected by concurrency control?
A) Atomicity
B) Consistency
C) Isolation
D) Durability
Answer: C

29. If a transaction fails, all changes made are:
A) Written to log
B) Rolled back
C) Committed
D) Ignored
Answer: B

30. What is the main goal of database recovery techniques?
A) Speed up queries
B) Increase redundancy
C) Maintain integrity and consistency
D) Add constraints
Answer: C