# QUESTION BANK

## DATABASE MANAGEMENT SYSTEMS

## BRANCH: CSE

### Unit – 1

### MCQ

1. Which one of the following cannot be taken as a primary key?
   a. Id
   b. Register number
   c. Dept_id
   **d. Street**

2. The relation with the attribute which is the primary key is referenced in another relation. The relation which has the attribute as a primary key is called
   a. Referential relation
   **b. Referencing relation**
   c. Referenced relation
   d. Referred relation

3. A _____ integrity constraint requires that the values appearing in specified attributes of any tuple in the referencing relation also appear in specified attributes of at least one tuple in the referenced relation.
   **a. Referential**
   b. Referencing
   c. Specific
   d. Primary

4. Student(ID, name, dept name, tot_cred)
   In this query which attributes form the primary key?
   a. Name
   b. Dept
   c. Tot_cred
   **d. ID**

5. Which one of the following is a procedural language?
   a. Domain relational calculus
   b. Tuple relational calculus
   **c. Relational algebra**
   d. Query language

6. The_____ operation allows the combining of two relations by merging pairs of tuples, one from each relation, into a single tuple.
   a. Select

b. **Join**
c. Union
d. Intersection

7. The result which operation contains all pairs of tuples from the two relations, regardless of whether their attribute values match.
   a. Join
   b. **Cartesian product**
   c. Intersection
   d. Set difference

8. A relational database consists of a collection of
   a. **Tables**
   b. Fields
   c. Records
   d. Keys

9. A _____ in a table represents a relationship among a set of values.
   a. Column
   b. Key
   c. **Row**
   d. Entry

10. The term _____ is used to refer to a row.
    a. Attribute
    b. **Tuple**
    c. Field
    d. Instance

11. The term attribute refers to a _____ of a table.
    a. Record
    b. **Column**
    c. Tuple
    d. Key

12. Database _____ which is the logical design of the database, and the database _____ which is a snapshot of the data in the database at a given instant in time.
    a. Instance, Schema
    b. Relation, Schema
    c. Relation, Domain
    d. **Schema, Instance**

13. Course(course_id,sec_id,semester)
    Here the course_id,sec_id and semester are _____ and course is a _____
    a. Relations, Attribute
    b. **Attributes, Relation**
    c. Tuple, Relation
    d. Tuple, Attributes

14. A domain is atomic if elements of the domain are considered to be _____ units.
    a. Different
    b. **Indivisbile**
    c. Constant
    d. Divisible

15. Which one of the following is a set of one or more attributes taken collectively to uniquely identify a record?
    a. Candidate key

b. Sub key
c. **Super key**
d. Foreign key

16. The subset of a super key is a candidate key under what condition?
    a. **No proper subset is a super key**
    b. All subsets are super keys
    c. Subset is a super key
    d. Each subset is a super key

17. A _____ is a property of the entire relation, rather than of the individual tuples in which each tuple is unique.
    a. Rows
    b. **Key**
    c. Attribute
    d. Fields

18. The _____ operation performs a set union of two "similarly structured" tables
    a. **Union**
    b. Join
    c. Product
    d. Intersect

19. The most commonly used operation in relational algebra for projecting a set of tuple from a relation is
    a. Join
    b. Projection
    c. **Select**
    d. Union

20. The _____ operator takes the results of two queries and returns only rows that appear in both result sets.
    a. Union
    b. **Intersect**
    c. Difference
    d. Projection

21. The _____ provides a set of operations that take one or more relations as input and return a relation as an output.
    a. Schematic representation
    b. **Relational algebra**
    c. Scheme diagram
    d. Relation flow

# Short Questions

1. List the drawback of normal File Processing System.
2. Define Data Abstraction and list the levels of Data Abstraction.
3. Define DBMS.
4. Define Data Independence.
5. Differentiate between physical and logical data independence.
6. Differentiate between DDL and DML.
7. Define Data Models and list the types of Data Model
8. Discuss about Object-Based Logical Models.
9. Define E-R model.
10. Define entity and entity set.
11. Define relationship and relationship set.
12. Define Object-Oriented Model.
13. Define Relational Model.
14. Define Network Model.
15. Define Hierarchical Model.
16. List the role of DBA.
17. List the different types of database-system users.
18. Write about the role of Transaction manager.
19. What is a weak entity? Explain with example?
20. Define Entity, Attributes, Entity set, relationship with appropriate notations?
21. What is Relational Instance, Relational Schema? Give one examples?
22. Draw the notation for multi-valued attributes? Give one example?
23. What are the different aggregate functions in SQL?

# Long Questions

1. Define Database? Discuss about applications of Database Systems?
2. What is Data Abstraction? Explain about different views of data?
3. Define Instance and Schema? List different data models and explain?
4. Explain about Database languages with examples?
5. Draw the Architecture of Database?
6. Discuss about Database users and Administrators?
7. Draw an ER diagram for a Banking System?
8. Draw the ER diagram for a company needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments, each department is managed by an employee, a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company
9. Write about logical database design (ER to Relational) with suitable examples?

# Unit – 2
## MCQ

1. Foreign key is the one in which the _____ of one relation is referenced in another relation.
   - a) Foreign key
   - **b) Primary key**
   - c) References
   - d) Check constraint
2. Data integrity constraints are used to:
   - a) Control who is allowed access to the data
   - b) Ensure that duplicate records are not entered into the table
   - **c) Improve the quality of data entered for a specific property (i.e., table column)**
   - d) Prevent users from changing the values stored in the table
3. Relational Algebra is a _____ query language that takes two relations as input and produces another relation as an output of the query.
   - a) Relational
   - b) Structural
   - **c) Procedural**
   - d) Fundamental
4. Which of the following is a fundamental operation in relational algebra?
   - a) Set intersection
   - b) Natural join
   - c) Assignment
   - **d) None of the mentioned**
5. Which is a join condition contains an equality operator:
   - **a) Equijoins**
   - b) Cartesian
   - c) Natural
   - d) Left
6. Which of the following is not outer join?
   - a) Left outer join
   - b) Right outer join
   - c) Full outer join
   - d) All of the mentioned
7. A query in the tuple relational calculus is expressed as:
   - a) $\{t \mid P() \mid t\}$
   - b) $\{P(t) \mid t \}$
   - **c) $\{t \mid P(t)\}$**
   - d) All of the mentioned
8. A set of possible data values is called
   - a) Attribute
   - b) Degree
   - c) Tuple
   - **d) Domain**
9. Entity is a _____
   - a) Object of relation
   - b) Present working model
   - **c) Thing in real world**

d) Model of relation
10. The attribute name could be structured as an attribute consisting of first name, middle initial, and last name. This type of attribute is called
   a) Simple attribute
   **b) Composite attribute**
   c) Multivalued attribute
   d) Derived attribute
11. The attribute AGE is calculated from DATE_OF_BIRTH. The attribute AGE is
   a) Single valued
   b) Multi valued
   c) Composite
   **d) Derived**
12. Which of the following can be a multivalued attribute?
   **a) Phone_number**
   b) Name
   c) Date_of_birth
   d) All of the mentioned
13. In a relation between the entities the type and condition of the relation should be specified. That is called as_____attribute.
   **a) Desciptive**
   b) Derived
   c) Recursive
   d) Relative
14. _____ express the number of entities to which another entity can be associated via a relationship set.
   **a) Mapping Cardinality**
   b) Relational Cardinality
   c) Participation Constraints
   d) None of the mentioned
15. An entity in A is associated with at most one entity in B, and an entity in B is associated with at most one entity in A. This is called as
   **a) One-to-many**
   b) One-to-one
   c) Many-to-many
   d) Many-to-one
16. An entity in A is associated with at most one entity in B. An entity in B, however, can be associated with any number (zero or more) of entities in A.
   **a) One-to-many**
   b) One-to-one
   c) Many-to-many
   d) Many-to-one
17. Establishing limits on allowable property values, and specifying a set of acceptable, predefined options that can be assigned to a property are examples of:
   a) Attributes
   **b) Data integrity constraints**
   c) Method constraints
   d) Referential integrity constraints
18. Drop Table cannot be used to drop a table referenced by a _____ constraint.
   a) Local Key

b) Primary Key
c) Composite Key
d) **Foreign Key**

19. We indicate roles in E-R diagrams by labeling the lines that connect _____ to _____
   a) Diamond , diamond
   b) **Rectangle, diamond**
   c) Rectangle, rectangle
   d) Diamond, rectangle

20. For a weak entity set to be meaningful, it must be associated with another entity set, called the
   a) **Identifying set**
   b) Neighbour set
   c) Strong entity set
   d) None

21. What term is used to refer to a specific record in your music database; for instance; information stored about a specific album?
   a) Relation
   b) Instance
   c) Table
   d) **Column**

22. The total participation by entities is represented in E-R diagram as
   a) Dashed line
   b) **Double line**
   c) Double rectangle
   d) Circle

23. Given the basic ER and relational models, which of the following is INCORRECT?
   a) An attribute of an entity can have more than one value
   b) An attribute of an entity can be composite
   c) In a row of a relational table, an attribute can have more than one value
   d) **In a row of a relational table, an attribute can have exactly one value or a NULL value**

24. What is a relationship called when it is maintained between two entities?
   a) Unary
   b) **Binary**
   c) Ternary
   d) Quaternary

25. A primary key is combined with a foreign key creates
   a) **Parent-Child relation ship between the tables that connect them**
   b) Many to many relationship between the tables that connect them
   c) Network model between the tables that connect them
   d) None of the mentioned

26. In the _____ normal form, a composite attribute is converted to individual attributes.
   a) **First**
   b) Second
   c) Third
   d) Fourth

27. A table on the many side of a one to many or many to many relationship must:
   a) Be in Second Normal Form (2NF)
   b) **Be in Third Normal Form (3NF)**
   c) Have a single attribute key

d) Have a composite key

28. Tables in second normal form (2NF):
    a) Eliminate all hidden dependencies
    b) Eliminate the possibility of a insertion anomalies
    c) Have a composite key
    **d) Have all non key fields depend on the whole primary key**

29. Functional Dependencies are the types of constraints that are based on_____
    **a) Key**
    b) Key revisited
    c) Superset key
    d) None of the mentioned

30. Which forms has a relation that possesses data about an individual entity:
    a) 2NF
    b) 3NF
    **c) 4NF**
    d) 5NF

31. The normal form which satisfies multivalued dependencies and which is in BCNF is
    **a) 4 NF**
    b) 3 NF
    c) 2 NF
    d) All of the mentioned

32. The main task carried out in the _____ is to remove repeating attributes to separate tables.
    **a) First Normal Form**
    b) Second Normal Form
    c) Third Normal Form
    d) Fourth Normal Form

33. Which of the normal form is based on multivalued dependencies?
    a) First
    b) Second
    c) Third
    **d) Fourth**

34. Fifth Normal form is concerned with
    a) Functional dependency
    b) Multivalued dependency
    **c) Join dependency**
    d) Domain-key

35. In 2NF
    a) No functional dependencies (FDs) exist
    b) No multivalued dependencies (MVDs) exist
    **c) No partial FDs exist**
    d) No partial MVDs exist

36. We can use the following three rules to find logically implied functional dependencies. This collection of rules is called
    a) Axioms
    **b) Armstrong's axioms**
    c) Armstrong
    d) Closure

37. Which of the following is not Armstrong's Axiom?
    a) Reflexivity rule

b) Transitivity rule
c) **Pseudo-transitivity rule**
d) Augmentation rule

38. There are two functional dependencies with the same set of attributes on the left side of the arrow:
A->BC
A->B
This can be combined as
   a) **A->BC**
   b) A->B
   c) B->C
   d) None of the mentioned

39. Consider a relation R (A, B, C, D, E) with the following functional dependencies:
ABC -> DE and
D -> AB
The number of superkeys of R is:
   a) 2
   b) 7
   c) **10**
   d) 12

## Short Questions

1. Explain the classification of functional dependency.
2. List and explain the properties of decomposition.
3. Prove that any relation schema with two attributes is BCNF.
4. Discuss about super key and candidate key in functional dependency with example.
5. Define functional dependency
6. Define Functional Dependency.
7. Define normalization
8. List the properties of decomposition.
9. Define First Normal Form.
10. Define Second Normal Form.
11. Define BCNF.
12. Define 3 Normal Form.
13. Define Fourth Normal Form.
14. Define 5NF or Join Dependencies.
15. Define Aggregate Functions.
16. Define Null Values.
17. Define Integrity Constraints.
18. Define Referential Integrity.
19. What is a SELECT operation?
20. What is a PROJECT operation?
21. What is foreign key?
22. What are the parts of SQL language?
23. Define tuple variable?

## Long Questions

1. Write about relational algebra? Discuss about different operators used in algebra.
2. Consider the following schema:

Suppliers (Sid, sname, address)
Parts (PID, pname, color)
Catalog (sid , pid, cost )

Write the relational algebraic expression for the following queries.

    a)     Find the name of suppliers who supply some red parts.
    b)     Find the sids of suppliers who supply some red or green parts.
    c)     Find the sids of suppliers who supply some red part or the part name is "hard disk".
    d)     Find the sids of suppliers who supply every part.

3. Draw an ER-Diagram for hospital Database and convert into relational model.
4. Differentiate the relational algebra and calculus.
5. What are the variations in relational calculus? Explain with examples.
6. What is a join? Explain about conditional join and natural join with syntax and example.
7. How to list and update row in a table? Explain with syntax and examples.
8. Discuss about outer joins with examples.
9. Differentiate BCNF with 3rd normal form.
10. Explain the following with suitable example:
    i) non-loss decomposition    ii) prime attribute
11. If R = {A, B, C, D, E} and FD's F = {A -> C, AC-> D, E->AD, E->H} List all the candidate keys.
12. Compute canonical cover Fc for the R= {A, B, C, D} and FD's= {A->BC, B->C, A->B AB->C, AC->D}.
13. What is redundancy? What are the problems caused by the redundancy?
14. Prove that a relation which is in 4NF must be in BCNF.
15. Define and explain 4NF with suitable example.
16. Define BCNF. How does BCNF differ from 3NF? Explain with example.
17. Explain 3NF. Give one example.
18. Explain about Full functional dependency and Partial dependency.
19. R= {A, B, C, G, H, I} and FD's are F= {A->B, B->HI, CG->H} Why R is not in 4NF?
20. Define normalization. List and Explain different normal forms with examples.
21. What is meant by multi-valued dependency? Explain with example.
22.   a.    Consider a relation schema R(A, B, C, D, E) with a set of FDs
            F = {A → B , BC →E, ED → A }
             1  List all keys of R
             2  Is R in 3NF
             3  Is R in BCNF

      b.    Describe briefly what is normalization? Why it is required?

23. What are Armstrong's axioms and why it's required? Use Armstrong axioms to prove the soundness of decomposition rule and pseudo transitive rule.
24. Consider the universal relation R = {A, B, C, D, E, F, G, H, I} and the set of Functional dependencies

F = { {A, B} -> {C}, {A} -> {D, E}, {B} -> {F}, {F} -> {G, H}, {D} -> {I, J} }. What is the key for R? Decompose R into 2NF, then 3NF relations.

25.   Write short notes on
   a. Dependency preservation
   b. Equivalence
   c. Functional Dependency
   d. Outer join

26.   Define Storage structure in DBMS. Explain the different types of indexing and their principles.


## Unit – 3
## MCQ

1.   The _____ is the fastest and most costly form of storage, which is relatively small; its use is managed by the computer system hardware.
   **a) Cache**
   b) Disk
   c) Main memory
   d) Flash memory

2.   Which of the following stores several gigabytes of data but usually lost when power failure?
   a) Flash memory
   b) Disk
   **c) Main memory**
   d) Secondary memory

3.   The flash memory storage used are
   a) NOR Flash
   b) OR Flash
   c) AND Flash
   **d) All of the mentioned**

4.   _____ is increasingly being used in server systems to improve performance by caching frequently used data, since it provides faster access than disk, with larger storage capacity than main memory.
   **a) Flash memory**
   b) Disk
   c) Main memory
   d) Secondary memory

5.   Which is the cheapest memory device in terms of costs/ bit?
   a) Semiconductor memory
   **b) Magnetic disks**
   c) Compact disks
   d) Magnetic tapes

6.   The primary medium for the long-term online storage of data is the _____ where the entire database is stored on magnetic disk.
   a) Semiconductor memory
   **b) Magnetic disks**
   c) Compact disks
   d) Magnetic tapes

7.  Optical disk _____ systems contain a few drives and numerous disks that can be loaded into one of the drives automatically (by a robot arm) on demand.
    a)  Tape Storage
    **b)  Jukebox**
    c)  Flash memory
    d)  All of the mentioned
8.  Tape storage is referred to as _____ storage.
    a)  Direct-access
    b)  Random-access
    **c)  Sequential-access**
    d)  All of the mentioned
9.  Which level of RAID refers to disk mirroring with block striping?
    **a)  RAID level 1**
    b)  RAID level 2
    c)  RAID level 0
    d)  RAID level 3
10. A unit of storage that can store one or more records in a hash file organization is denoted as
    **a)  Buckets**
    b)  Disk pages
    c)  Blocks
    d)  Nodes
11. The file organization which allows us to read records that would satisfy the join condition by using one block read is
    a)  Heap file organization
    b)  Sequential file organization
    **c)  Clustering file organization**
    d)  Hash file organization
12. A top-to-bottom relationship among the items in a database is established by a
    **a)  Hierarchical schema**
    b)  Network schema
    c)  Relational schema
    d)  All of the mentioned
13. Which level of RAID refers to disk mirroring with block striping?
    **a)  RAID level 1**
    b)  RAID level 2
    c)  RAID level 0
    d)  RAID level 3
14. With multiple disks, we can improve the transfer rate as well by _____ data across multiple disks.
    **a)  Striping**
    b)  Dividing
    c)  Mirroring
    d)  Dividing
15. Which one of the following is a Stripping technique?
    a)  Byte level stripping
    b)  Raid level stripping
    c)  Disk level stripping
    **d)  Block level stripping**
16. The RAID level which mirroring is done along with stripping is

a) **RAID 1+0**
b) RAID 0
c) RAID 2
d) Both RAID 1+0 and RAID 0

17. Where performance and reliability are both important, RAID level _____ is used.
   a) 0
   b) 1
   c) 2
   d) **0+1**

18. In ordered indices the file containing the records is sequentially ordered, a _____ is an index whose search key also defines the sequential order of the file.
   a) **Clustered index**
   b) Structured index
   c) Unstructured index
   d) Nonclustered index

19. Indices whose search key specifies an order different from the sequential order of the file are called _____ indices.
   a) **Non-clustered**
   b) Secondary
   c) All of the mentioned
   d) None of the mentioned

20. In a _____ clustering index, the index record contains the search-key value and a pointer to the first data record with that search-key value and the rest of the records will be in the sequential pointers.
   a) **Dense**
   b) Sparse
   c) Straight
   d) Continuous

21. In a _____ index, an index entry appears for only some of the search-key values.
   a) **Dense**
   b) Sparse
   c) Straight
   d) Continuous

22. In case the indices values are larger, index is created for these values of the index. This is called
   a) Pointed index
   b) Sequential index
   c) **Multilevel index**
   d) Multiple index

23. Storage devices like tertiary storage, magnetic disk comes under
   a) Volatile storage
   b) **Non-volatile storage**
   c) Stable storage
   d) Dynamic storage

24. For a transaction to be durable, its changes need to be written to _____ storage.
   a) Volatile storage
   b) Non-volatile storage
   c) **Stable storage**
   d) Dynamic storage

25. The unit of storage that can store one are more records in a hash file organization are

a) **Buckets**
b) Disk pages
c) Blocks
d) Nodes

26. A _____ file system is software that enables multiple computers to share file storage while maintaining consistent space allocation and file content.
   a) Storage
   b) Tertiary
   c) Secondary
   d) **Cluster**

## Short Questions

1. Define Cache?
2. Explain Optical Storage Device?
3. Define RAID.
4. Define file organization
5. Define Hash indices?
6. Define dense index?
7. Define sparse index?
8. Define Static Hashing?
9. What are the types of storage devices?
10. Define access time.
11. Define seek time.
12. Define average seek time.
13. Define rotational latency time.
14. Define average latency time.
15. What is meant by data transfer rate?
16. What is meant by mean time to failure?
17. Give one example for Linear hashing?
18. What is known as a search key?

## Long Questions

1. Explain classification of storage structure
2. Discuss about file organizations and indexing?
3. Explain about Index structures?
4. What is clustered index organization? Illustrate with example?
5. Write about the various levels of RAID with neat diagrams

## Module – 4
## MCQ

1. A _____ consists of a sequence of query and/or update statements.
   a. **Transaction**
   b. Commit
   c. Rollback
   d. Flashback
2. In order to undo the work of transaction after last commit which one should be used?

a. View
b. Commit
**c. Rollback**
d. Flashback

3. In case of any shut down during transaction before commit which of the following statement is done automatically?
   a. View
   b. Commit
   **c. Rollback**
   d. Flashback

4. Transaction processing is associated with everything below except
   a. Conforming an action or triggering a response
   b. Producing detail summary or exception report
   **c. Recording a business activity**
   d. Maintaining a data

5. _____ will undo all statements up to commit?
   a. Transaction
   b. Flashback
   **c. Rollback**
   d. Abort

6. Identify the characteristics of transactions
   a) Atomicity
   b) Durability
   c) Isolation
   **d) All of the mentioned**

7. Which of the following has "all-or-none" property?
   **a) Atomicity**
   b) Durability
   c) Isolation
   d) All of the mentioned

8. The database system must take special actions to ensure that transactions operate properly without interference from concurrently executing database statements. This property is referred to as
   a) Atomicity
   b) Durability
   **c) Isolation**
   d) All of the mentioned

9. The property of a transaction that persists all the crashes is
   a) Atomicity
   **b) Durability**
   c) Isolation
   d) All of the mentioned

10. _____ states that only valid data will be written to the database.
    **a) Consistency**
    b) Atomicity
    c) Durability
    d) Isolation

11. Transaction processing is associated with everything below except
    a) Producing detail summary or exception reports
    **b) Recording a business activity**

c) Confirming an action or triggering a response
d) Maintaining a data

12. DBMS periodically suspends all processing and synchronizes its files and journals through the use of
    a) **Checkpoint facility**
    b) Backup facility
    c) Recovery manager
    d) Database change log

13. Which of the following is not a state in transaction?
    a) Active
    b) **Terminated**
    c) Aborted
    d) Partially committed

14. Which of the following are introduced to reduce the overheads caused by the log-based recovery?
    a) **Checkpoints**
    b) Indices
    c) Deadlocks
    d) Locks

15. Which of the following protocols ensures conflict serializability and safety from deadlocks?
    a) Two-phase locking protocol
    b) **Time-stamp ordering protocol**
    c) Graph based protocol
    d) None of the mentioned

16. Which of the following is the block that is not permitted to be written back to the disk?
    a) Dead code
    b) Read only
    c) **Pinned**
    d) Zapped

17. If transaction Ti gets an explicit lock on the file Fc in exclusive mode, then it has an _____ on all the records belonging to that file.
    a) **Explicit lock in exclusive mode**
    b) Implicit lock in shared mode
    c) Explicit lock in shared mode
    d) Implicit lock in exclusive mode

18. Which refers to a property of computer to run several operation simultaneously and possible as computers await response of each other
    a) **Concurrency**
    b) Deadlock
    c) Backup
    d) Recovery

19. A system is in a _____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.
    a) Idle
    b) Waiting
    c) **Deadlock**
    d) Ready

20. The deadlock state can be changed back to stable state by using _____ statement.
    a) Commit
    b) **Rollback**

        c) Savepoint
        d) Deadlock

21.    The deadlock in a set of a transaction can be determined by
        a) Read-only graph
        b) Wait graph
        **c) Wait-for graph**
        d) All of the mentioned
22.    A deadlock exists in the system if and only if the wait-for graph contains a _____
        **a) Cycle**
        b) Direction
        c) Bi-direction
        d) Rotation
23.    _____ rollback requires the system to maintain additional information about the state of all the running transactions.
        a) Total
        **b) Partial**
        c) Time
        d) Commit

## Short Questions:

1. What is Recovery?
2. What is Transactions?
3. What is Recovery Log?
4. What is COMMIT Point
5. What is Transaction Recovery?
6. Briefly write The ACID Properties
7. What is Two Phase Commit?
8. What is Concurrency?
9. What is transaction?
10. List the possible transaction states.
11. What are the Three Concurrency Problems?
12. What is locking?
13. What is Deadlock?
14. What is Serializability?
15. What are the two statements regarding transaction?
16. When a transaction is is said to be rolled back?

## Long questions

1. Explain transaction states with example?
2. Explain ACID properties of transaction management
3. Explain serializability in transaction management
4. Explain concurrency control with lock based protocols
5. Explain in detail about Lock based protocols and Timestamp based protocols.
6. Explain the concept of Deadlock avoidance and prevention in detail.