## UNIT-1: Advanced SQL Concepts

1. What is the difference between GROUP BY and ORDER BY in SQL? Provide an example of each.
2. Explain the different types of joins in SQL with examples (INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL JOIN).
3. What is a subquery? Explain correlated vs. non-correlated subqueries with examples.
4. Differentiate between a primary key, foreign key, and unique key in SQL.
5. Explain system functions and provide examples of string, numeric, and date functions in SQL.
6. What are User-Defined Functions (UDFs) in SQL? How do they differ from system functions?
7. What are stored procedures in SQL, and how do you pass parameters to them? Provide an example.
8. What is the difference between a procedure and a function in SQL?
9. What is a cursor in SQL, and when should it be used? Explain with an example.
10. Explain triggers in SQL. What are the different types of triggers, and how are they used for exception handling?
11. **Queries and program.**

## UNIT-2: Entity-Relationship Model and Relational Database Design

1. Define an entity and an attribute in the E-R model. What are the different types of attributes?
2. Explain the concept of mapping cardinality in an E-R diagram with examples.
3. What is specialization and generalization in the E-R model? How do they differ from each other?
4. What is the process of reducing an E-R diagram to relational schemas? Give an example.
5. Explain functional dependency (FD) in relational database design with an example.
6. What are the different types of anomalies in relational databases? How does normalization resolve them?
7. Describe the process of decomposing a relation into 1NF, 2NF, and 3NF with an example.
8. What is BCNF (Boyce-Codd Normal Form)? How is it different from 3NF?
9. Explain multivalued dependency and the concept of 4NF with an example.
10. What is join dependency, and how is it related to 5NF in relational database design?
11. **Draw an E-R diagram.**

## UNIT-3: Query Processing, Query Optimization, and Transaction Management

1. What are the main steps involved in query processing in a database management system?
2. Explain query optimization and why it is important. How does a query optimizer work?
3. Define a transaction in the context of databases. What are the ACID properties?
4. What the different states of a transaction are as depicted in a transaction state diagram?
5. What is the difference between serial and non-serial schedules? Explain serializability.
6. What is a two-phase locking protocol?
7. Explain the two-phase commit protocol.
8. Explain log-based recovery with example.
9. What is a deadlock in transaction management, and how can it be detected and resolved?

## UNIT-4: Introduction to NoSQL & Basic MongoDB Operations

1. What is NoSQL, and how does it differ from traditional RDBMS?
2. Explain the advantages and disadvantages of using NoSQL databases.
3. What are the different types of NoSQL databases (Key-Value, Document, Column-family, Graph)? Provide examples.
4. In what scenarios should NoSQL databases be used over RDBMS?
5. What are the key differences between MongoDB and traditional relational databases like MySQL or SQL Server?
6. Explain basic database commands in MongoDB such as insert(), find(), update(), and delete().
7. How do CRUD operations work in MongoDB? Provide examples for each operation.
8. How do you create a collection and insert a document in MongoDB? Provide a simple example.
9. How do you update multiple documents in MongoDB using the updateMany() method?
10. Explain how MongoDB handles schema-less data, and how it differs from RDBMS in terms of schema design.
11. **Queries**

## UNIT-5: Advanced MongoDB Concepts

1. What is aggregation in MongoDB, Explain with the help example?
2. How are indexes created in MongoDB, and what is their importance in query optimization?
3. Explain how regular expressions (regex) are used in MongoDB queries. Provide an example.
4. How does MongoDB enforce schema validation? Provide an example of a schema validation rule.
5. What are embedded documents in MongoDB, and how are they different from references?
6. How can you create a user and assign roles in MongoDB? Provide an example.
7. What is a cursor in MongoDB explain with the help of example.
8. What is the role of the aggregate () function in MongoDB, and how can it be used.
9. **Queries**