

**Assignment Questions**

**UNIT-I**

1. Draw and explain the detailed system architecture of DBMS.
2. a) What are the advantages of DBMS?  
b) Describe the concept of client/server model.
3. Discuss the main characteristics of the database approach and specify how it differs from traditional file system.
4. Explain in detail about the three tier schema architecture of DBMS.
5. Discuss the activities of different database users.
6. Briefly describe various architectures of database systems.
7. Compare the database system with conventional file system.
8. Describe in detail about two-tier and three-tier client-server architectures.
9. What are the different data models present and explain briefly?
10. a) Explain the role of a data base administrator.  
b) Explain the merits and demerits of data base system.

**UNIT-II**

1. Explain in detail about various key constraints used in database system.
2. a) Explain the importance of Null values in Relational Model.  
b) Describe the concept of Referential Integrity.
3. Write a short notes on i) Foreign Key ii) Relation state iii) Database schema.
4. Discuss the mechanism of attribute relationship inheritance. How is it useful?
5. a) What is a relation? Describe the characteristics of a relation.  
b) Discuss the importance of entity integrity and referential integrity constraints.
6. a) What is relation schema and state?  
b) Draw an ER diagram for Hospital management system.
- 7 a) Differentiate specialization and generalization.  
b) What is a view? How views are implemented?
- 8 a) Discuss in detail about the concepts of E-R model with suitable examples.  
b) Explain about various constraints used in ER-model.
9. Explain about the different operations in Relational Algebra.
10. a) Explain about the TRC.  
b) Explain about the DRC.

### **UNIT-III**

1. List and explain the common data types available in SQL.
2. Explain the importance of avoiding NULL values in a database .
3. Write short notes on i) DDL ii) DML iii) Database Schema.
4. Write and explain the structure of SQL SELECT statement with suitable example
5. By considering an example describe various data update operations in SQL.
6. What is a group function? List and explain how to use group functions in SQL with appropriate examples.
  
7. Differentiate between independent and correlated nested queries.
8. Consider the following schemas:  
Sailors (sid, sname, rating, age)  
Reserves (sid, bid, day)  
Boats (bid, bname, color)  
Write the following queries in relational algebra, tuple relational Calculus and domain relational calculus:
  - a) Find the name of sailors who have reserved boat 103.
  - b) Find the names and ages of sailors with a rating above 7.
  - c) Find the names of sailors who have reserved a red boat.
  - d) Find the sname, bid, and day for each reservation.
  - e) Find the name of sailors who have reserved at least one boat.
9. What is a trigger? How to create it? Discuss various types of triggers.
10. List the SQL functions for string conversions.

### **UNIT-IV**

1. Explain insertion, deletion and modification anomalies with suitable examples.
2. State BCNF. How does it differ from 3NF?
3. What is meant by the closure of functional dependencies? Illustrate with an example.
4. State 1NF, 2NF & 3NF and explain with examples.
5. State the Armstrong inference rules. Provide suitable examples to describe each.
6. Show how to preserve Functional Dependencies during decomposition.
7. What is normalization? Explain its need.
8. Discuss in detail about various normal forms.
9. What is multi valued dependency? Illustrate 4NF with an example
10. What is Functional Dependency? Explain types and properties of FD's.

## **UNIT-V**

1. Draw transaction state diagram and describe each state that a transaction goes through during its execution.
2. Explain in detail about timestamp based concurrency control techniques.
3. Discuss about different types of failures.
4. What is 2-phase locking protocol? How does it guarantee serializability?
5. Why the concurrency control is needed? Explain it.
6. Write and explain optimistic concurrency control algorithm.
7. Write short notes on:
  - i) Phantom Record ii) Repeatable Read iii) Incorrect Summary iv) Dirty Read.
8. Describe Wait/Die and Wound/Wait deadlock protocols.
9. What is transaction? Mention the desirable properties of a transaction.
10. Discuss about transaction recovery techniques.

## **UNIT-VI**

1. Explain in detail about internal hashing Techniques.
2. Discuss in detail about cluster and Multilevel indexes.
3. Explain in detail about external hashing techniques.
4. By considering an example, show how to reduce access time with primary index.
5. When does a collision occur in hashing? Illustrate various collision resolution techniques.
6. Describe different methods of defining indexes on multiple keys.
7. Discuss in detail about primary file organization.
8. By considering relevant example, show insertion and deletion operations on a B-tree.
9. Distinguish between:
  - i) Primary and Secondary indexing. ii) Ordered indexing and hashing.
10. Explain in detail about B+ trees.

## **Short Questions:**

### **UNIT-1:**

- 1) What is DBA? Mention the functionalities of DBA.
- 2) List different types of database users.
- 3) List out the characteristics of database system.
- 4) List out Data base applications.
- 5) Differentiate between schema and instance.
- 6) What is Data independence?
- 7) What is Database system? Give any four features that a database system should provide to its users.

**UNIT-2:**

- 1) What is a view? Explain it.
- 2) Mention various DML operations with examples.
- 3) Distinguish between primary and super keys.
- 4) Write the syntax for UPDATE command in SQL.
- 5) What is the importance of handling null values in a relation?
- 6) Write and describe the structure of SQL SELECT statement.
- 7) Define domain, attribute, tuple and relation.
- 8) Show how data integrity can be guaranteed by using different database constraints.

**UNIT-3:**

- 1) Describe the properties of a relation.
- 2) Explain the difference among Entity, Entity Type & Entity Set
- 3) Specify and explain various structural constraints of relationship type.
- 4) Write short notes on nested queries.
- 5) List SQL grouping functions with examples.
- 6) Describe entities and relationships with examples.
- 7) Illustrate the implementation of equi-join and outer joins in SQL.
- 8) Differentiate specialization and generalization.

**UNIT-4:**

- 1) What is Functional Dependency? Explain it briefly.
- 2) Briefly describe BCNF.
- 3) Mention the desirable properties of relation decomposition
- 4) What is an objective of the normalization?
- 5) Describe lossless join decomposition.
- 6) Define surrogate key and specify an example of it.
- 7) Explain the need of schema refinement.
- 8) By means of an example show how BCNF is stronger than 3NF.

**UNIT-5:**

- 1) Illustrate lost update problem with suitable example.
- 2) Briefly discuss about different types of schedules.
- 3) Describe Wait/Die & Wound/Wait protocols.
- 4) Explain about deadlocks.
- 5) State and explain two-phase locking protocol.
- 6) What is transaction log? Mention its content
- 7) What is a database trigger? Give an example of trigger definition.
- 8) Explain Grant and Revoke commands with examples.

**UNIT-6:**

- 1) What is the purpose of file header?
- 2) List out the operations that can be performed on files.
- 3) Differentiate between internal and external hashing
- 4) Explain about hash based indexing.
- 5) What is multilevel indexing?
- 6) Describe the structure of a node in B-tree
- 7) Differentiate between spanned and unspanned records
- 8) What is hashing? Explain it briefly.

**Signature of the Faculty**

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