

**Database Management Systems**  
**UNIT-I**  
**Short answer Questions**

1. Define the terms data and information?
2. Define (i) Database (ii)DBMS
3. List the advantages and applications of DBMS?
4. What are the disadvantages of file processing system?
5. Define instances and schemas of database?
6. What is data model? List the types of data models?
7. Discuss about Data Definition language?
8. Discuss about Data Manipulation language?
9. What is data Abstraction? Give the levels of data abstraction?
10. Who is DBA? What are the responsibilities of DBA?
11. Discuss Data Independence?
12. What is an entity relationship model?
13. Define (i) Entity (ii) Attribute
14. Define Relationship and Relationship set?
15. What are key constraint and participating constraints?
16. Define weak entity and strong entity sets?
17. Define relation, relation instance and relation schema.
18. Define i) super key ii) candidate key iii) primary key
19. Explain the use of foreign key constraint?
20. Define the terms arity and cardinality of relation?
21. What are domain constraints
22. Explain about querying relational data?
23. Define views?
24. Discuss how can you change the data in the table?
25. List various types of attributes?
26. Discuss how can you alter and destroy tables?
27. Explain the use of null values?

## Long answer Questions

1. Compare and Contrast file Systems with database system?
2. Define Data Abstraction and discuss levels of Abstraction?
3. Discuss about different types of Data models?
4. Describe the architecture of DBMS?
5. Discuss additional features of the ER-Models?
6. Discuss about the Conceptual Design with the ER-Model?
7. Write about views and updates on views?
8. Explain different types of database users and write the functions of DBA?
9. Explain about different types of integrity constraints?
10. Discuss about the logical database Design?
11. Distinguish strong entity set with weak entity set? Draw an ER diagram to illustrate Weak entity set?
12. Explain how the integrity constraints are specified and enforces?
13. Explain in detail about views?

## UNIT-II

### Short answer Questions

- 1 Define relational database query?
- 2 Explain different types of query languages?
- 3 Explain about relational algebra?
- 4 State about SELECT operation in Relational algebra?
- 5 State about PROJECT operation in Relational algebra?
- 6 Explain about set operations?
- 7 Discuss the use of rename operation?
- 8 Define join ? Explain different join operations?
- 9 Illustrate division operation?
- 10 Explain about tuple relational calculus?
- 11 Explain about Domain relational calculus?
- 12 Discuss about the expressive power of relational algebra and calculus?

- 13 Discuss the basic form of SQL query?
- 14 Explain the working of union, intersection and except operations?
- 15 Define nested queries?
- 16 Define correlated nested queries?
- 17 Explain Aggregate Functions?
- 18 What is the use of groupby and having clauses?
- 19 Define Null Values?
- 20 Define tuple variable with its syntax?
- 21 Define outer join? Explain its types?
- 22 Explain how to create new domain?
- 23 Define Assertions?
- 24 Discuss about trigger?
- 25 Demonstrate how to add a NOT NULL column to a table?
- 26 Write a TRC query to find the names of sailors who have reserved boat103?
- 27 Write a DRC query to find the names of sailors who have reserved red boat?

### **Long answer Questions**

1. Illustrate different operations in Relational algebra with an example?
2. Define Join? Explain different types of joins?
3. Discuss about Relational calculus in detail?
4. Define trigger and explain its three parts? Differentiate row level and statement level triggers?
5. Illustrate Group by and having clauses with examples?
6. Discuss about Complex integrity constraints in SQL?
7. Define null value? Describe the effect of null values in database?
8. Discuss different types of aggregate operators with examples in SQL?
9. a Define a nested query?  
b Write a nested query to find the names of sailors who have reserved both a red and green boat?  
c. Write a nested query to find the names of sailors who have reserved all boats?

- 9 a. Discuss correlated nested queries?
- b. Write a query to find the names of sailors who have reserved a red boat?
- c. Write a query to find the names of sailors who have not reserved a red boat?

## **UNIT-III**

### **Short answer Questions**

1. Define redundancy?
2. Define functional dependency?
3. Explain the problems with Redundancy?
4. What is decomposition? Explain the properties of Decomposition?
5. Discuss normalization?
6. Illustrate functional dependency with example?
7. Illustrate fully functional dependency with example?
8. Demonstrate transitive dependency? Give an example?
9. Define First Normal Form?
10. Define Second Normal Form?
11. Define Third Normal Form?
12. Explain about Loss Less Join Decomposition?
13. Describe Dependency Preserving Decomposition?
14. What is multi valued Dependency?
15. Define Fourth Normal Form?
16. Define Join Dependency?
17. Define BCNF?
18. Explain Fifth Normal Form?
19. Explain about Inclusion Dependency?

### **Long answer Questions**

1. Illustrate redundancy and the problems that it can cause

2. Define decomposition and how does it address redundancy? Discuss the problems that may be caused by the use of decompositions?
3. Define functional dependencies. How are primary keys related to FD's?
4. Define normalization? Explain 1NF,2NF,3NF normal forms
5. Compare and contrast BCNF with 3NF?
6. Describe properties of decompositions

## **UNIT-IV**

### **Short answer Questions**

1. Define a Transaction? List the properties of transaction
2. Discuss different phases(states) of transaction?
3. What is shadow copy technique?
4. List the advantages of concurrent execution?
5. Define Schedule? What is a serial schedule?
6. Discuss the Procedure to test Serializability?
7. Demonstrate Conflict Serializability?
8. Discuss View Serializability?
9. Discuss recoverable schedules?
10. Discuss cascade less schedules?
11. Explain the procedure to test for serializability?
12. Explain about different types of locks?
13. Define Deadlock?
14. Explain about locking protocols?
15. Define Two Phase locking protocol?
16. Demonstrate the implementation of Isolation?
17. Explain how the locks are implemented?
18. Explain the rules of tree protocol?
19. What is timestamp? Explain different timestamps used by a transaction?
20. Explain Thomas write rule?
21. What are the phases of validation based protocol?
22. Explain different timestamps used by validation protocol?
23. Define granularity?

24. Discuss about Failure Classification?
25. What are different storage types?
26. What are the fields of update record?
27. Discuss log based recovery?
28. Differentiate deferred and immediate database modifications?
29. Define a checkpoint?
30. Discuss the failures that can occur with loss of Non-volatile storage
31. Explain about ARIES?

### **Long answer Questions**

1. Explain ACID properties and illustrate them through examples?
2. Discuss How do you implement Atomicity and Durability
3. Illustrate Concurrent execution of transaction with examples
4. Discuss Serializability in detail?
5. Discuss two phase locking protocol and strict two phase locking protocols?
6. Describe Times tamp based locking protocols?
7. Describe Validation-based locking protocols?
8. Discuss in detail Multiple Granularity?
9. Explain in detail storage structure
10. Discuss how do you recover from failure?
11. Explain Buffer Management?
12. Explain different types of advanced recovery techniques
13. Write in detail about Remote Backup systems?

### **UNIT-V**

### **Short answer Questions**

1. Discuss about data on External storage?
2. What is indexing and what are the different kinds of indexing?
3. Explain Clustered Indexes?
4. Discuss the Primary and Secondary indexes?
5. Define Tree Indexing?
6. Explain Hash based Indexing?
7. Compare different file organizations?
8. Discuss the intuition for Tree Indexes?
9. Define Indexed Sequential Access Method?
10. Discuss about Overflow pages and Locking considerations of ISAM?
11. Discuss the Cost model of Heap files, Sorted files and Clustered files?
12. Explain the structure of B+ tree?
13. Describe how the insert and delete operations are performed in B+ tree?
14. Explain how search is performed in B+ tree?
15. Define static Hashing?
16. Explain extendible hashing?
17. Define linear hashing?
18. Differentiate between linear and extensible hashing?

### **Long answer Questions**

1. Write in detail about hash based indexing and Tree based indexing
2. Compare I/O costs for all file organizations
3. Explain in detail about ISAM
4. Explain about B+ tree index file?
5. Demonstrate searching a given element in B+ trees? Explain with example?
6. Illustrate insertion of an element in B+ Tree with example
7. Illustrate deletion of an element in B+ Tree with example
8. Write in detail about Static Hashing
9. Explain in detail about Extendible hashing
10. Explain in detail about Linear hashing

11. Compare and contrast Extendible hashing With Linear hashing