



## CS6302- Database Management Systems

### QUESTION BANK

#### UNIT-I

#### INTRODUCTION TO DBMS

##### Part A

1. What is database?
2. Define Database Management System.
3. Advantages of DBMS?
4. Disadvantages in File Processing System.
5. Define Data independence.
6. Define Data Models and list the types of Data Model.
7. What is E-R model?
8. Define entity and entity set.
9. What is Weak entity set?
10. Define relationship and relationship set.
11. What is object Oriented Model?
12. Define Record-Based Logical Models.
13. Define Relational model.
14. Define Network model.
15. Define Hierarchical Model
16. List the role of DBA.
17. List the different type of database system user.
18. Write about the role of Transaction manager.
19. Write about role of storage manager.
20. Define attributes.
21. Define mapping constraints.
22. Define Relational algebra.
23. Define Relational calculus.
24. List possible operations in Relation algebra
25. Is it possible for several attributes to have the same domain? Illustrate your answer with suitable example.
26. What are the problems in data redundancy?

##### Part B

1. With a neat diagram, explain the structure of a DBMS.
2. What is data integrity? Explain the types of integrity constraints.
3. Explain 1NF, 2NF, 3NF and BCNF with suitable example.
4. What are the pitfalls in relational database design? With a suitable example, explain the role of functional dependency in the process of normalization.
5. Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. State any assumption you make.
6. What is aggregation in an ER model? Develop an ER diagram using aggregation that captures the following information:



# SYED AMMAL ENGINEERING COLLEGE

(An ISO 9001: 2008 certified Institution)

Dr. E.M.Abdullah Campus, Ramanathapuram – 623 502.



## Department of Computer Science and Engineering

Employees work for projects. An employee working for a particular project uses various machinery. A unnecessary attributes. State any options you make. Also discuss about the ER

7. With relevant examples discuss the various operations in Relational Algebras
8. Define a functional dependency. List and discuss the six inference rules for functional dependencies. Give relevant examples.
9. Explain the three different groups of data models with examples.
10. Discuss Join Dependencies and Fifth Normal Form, and explain why 5NF?

## UNIT II

### SQL & QUERY OPTIMIZATION

#### Part A

1. Define Aggregate Functions in SQL?
2. Define Nested Subqueries.
3. Define Integrity constraints.
4. Define referential Integrity.
5. Define Assertions.
6. Define Triggers.
7. Define Functional Dependency
8. List the pitfalls in Relational Database Design.
9. Define normalization?
10. List the properties of decomposition.
11. Define 1NF?
12. Define 2 NF?
13. Define 3NF?
14. What is BCNF?
15. What is query?
16. What do you mean by Correlated subquery?
17. Define SQL and state the difference between SQL and other conventional programming Language.
18. What is database trigger is a PL/SQL block that can defined to automatically
19. What are Armstrong rules?
20. What are the privileges that can be granted on a table by a user to others?
21. What is the difference between TRUNCATE and DELETE command?
22. What is the use of CASCADE CONSTRAINTS?
23. Is it possible for several attributes to have the same domain? Illustrate you answer with suitable examples.
24. List out the field level constraints that can be associated with relational table.
25. Justify the need for normalization.
26. Name the different type of joins supported in SQL.

#### Part B

1. What is a view? How can it be created? Explain with an example.
2. Discuss in detail the operators SELECT, PROJECT, UNION with suitable examples.
3. Explain static and dynamic SQL in detail.
4. Diagrammatically illustrate and discuss the steps involved in processing a query.
5. Give briefly about Query evaluations cost & Selection operation
6. How does a DBMS represent a relational query evaluation plan?
7. Since indices speed query processing, why might they not be kept on several search keys?



# SYED AMMAL ENGINEERING COLLEGE

(An ISO 9001: 2008 certified Institution)

Dr. E.M.Abdullah Campus, Ramanathapuram – 623 502.



## Department of Computer Science and Engineering

List as many reasons as possible.

8. Consider the database given by the following schemes.

Customer (Cust\_No, Sales\_Person\_No, City)

Sales\_Person (Sales\_Person\_No, Sales\_Person\_Name,

Common\_Prec, Year\_of\_Hire)

Give an expression in SQL for each of the following queries:

1. Display the list of all customers by Cust\_No with the city in which each is located.
2. Select Cust No, city from Customer
3. List the names of the sales persons who have accounts in Delhi.
4. Select Sales\_Person\_Name from Sales\_Person\_Name where (select \* from customer where city = delhi)

9. Write short notes on the following:

Data Manipulation Language (DML), Data Definition Language (DDL)

Transaction Control Statements (TCS), Data Control Language (DCL)

10. Consider the employee database, where the primary keys are Underlined.

employee(empname, street, city)

works(empname, companyname, salary)

company(companyname, city)

manages(empname, management)

Give an expression in the relational algebra for each request.

- 1) Find the names of all employees who work for First Bank Corporation.
- 2) Find the names, street addresses and cities of residence of all employees who work for First Bank Corporation and earn more than 200000 per annum.
- 3) Find the names of all employees in this database who live in the same city as the company for which they work.
- 4) Find the names of all employees who earn more than every employees of small Bank Corpor

## UNIT – III

### TRANSACTION AND CONCURRENCY CONTROL

#### Part A

1. What is transaction?
2. Define atomicity?
3. Define Durability?
4. What is transaction-management component?
5. List the properties of transaction.
6. Define concurrency control?
7. What are the two operation access data in transaction?
8. What do you mean by read only transaction?
9. What are the steps followed in Executing read(x) command in transaction?
10. What are the steps followed in executing write(x) command in transaction?
11. List out the transaction states?
12. What are the need for concurrency?
13. Define Schedule.
14. When the schedule is called serial?
15. When two operation in schedule are said to be conflict?
16. Define cascading rollback?
17. When the schedule is said to cascade less?
18. Define serializability.



# SYED AMMAL ENGINEERING COLLEGE

(An ISO 9001: 2008 certified Institution)

Dr. E.M.Abdullah Campus, Ramanathapuram – 623 502.



## Department of Computer Science and Engineering

19. When the serializability is equivalent?
20. When two schedule are called result equivalent?
21. How to find the schedule is conflict serialization or non using procedure graph?
22. Define Concurrency control?
23. Define lock?
24. Define lock table?
25. What you mean by lock conversion?
26. List out the two-phase locking?
27. When the system is said to deadlock?
28. What are the methods in deadlock?
29. Define timestamps?
30. What are the different methods for deadlock prevention?
31. How detect the deadlock?
32. What are the methods to follow the recovery from deadlock?
33. List out type of failure?
34. List out the draw backs of shadow-page?

### Part B

1. Describe about testing of Serializability.
2. Explain the deferred and immediate modification versions of the log based recovery scheme.
3. What are different types of schedules are acceptable for recoverability.
4. Discuss on strict, two-phase locking protocol and time stamp-based protocol.
5. Explain Time stamp-Based Concurrency Control protocol and the modifications implemented in it.
6. Describe shadow paging recovery techniques.
7. How can you implement atomicity in transactions? Explain.
8. Describe the concept of serializability with suitable example.
9. How concurrency is performed? Explain the protocol that is used to maintain the concurrency concept

## UNIT – IV

### TRENDS IN DATABASE TECHNOLOGY

#### Part A

1. Explain Optical Storage Device?
2. Define cache.
3. Define disk controller?
4. Define RAID.
5. Define file organization.
6. Define Hash indices?
7. Define dense index?
8. Define sparse index?
9. Differentiate between dense index and sparse index.
10. Explain B+ tree index structure?
11. Define Static Hashing?
12. Define Query processing?
13. What are the steps involved in query processing?
14. What is indexing and What are the different kinds of indexing?
15. What is meant by query optimization?
16. What is Buffer Manager?
17. What is hashing?



# SYED AMMAL ENGINEERING COLLEGE

(An ISO 9001: 2008 certified Institution)

Dr. E.M.Abdullah Campus, Ramanathapuram – 623 502.

## Department of Computer Science and Engineering



18. List out disadvantage of Hashing?
19. Define data striping?
20. Define double buffering?
21. What is file descriptor?
22. List out the operation of files?
23. What is the purpose of buffer manager?
24. What are the cost components for query execution?
25. What are the properties of B trees?
26. How does pipelining improve query-evaluation efficiency? Explain.

### Part B

1. What is RAID? Explain in detail.
2. Describe static hashing and dynamic hashing.
3. Describe the different types of file organization? Explain using a sketch of each of them with their advantages and disadvantages.
4. Briefly write the overall process of data ware housing.
5. Illustrate the issues to implement distributed databases.
6. Describe the structure of B+ tree and give the algorithm for search in the B+ tree with example.
7. Explain why allocations of records to blocks affect database system performance significantly.
8. What are the types of Knowledge discovered data mining? Explain with suitable example.
9. Briefly write the overall process of Multidimensional and Parallel databases.
10. Describe the structure of multimedia databases.
11. Explain the architecture of mobile and web database with neat sketch.

## UNIT V ADVANCED TOPICS

### Part A

1. What is Data warehousing?
2. Define Integrity.
3. What are Deductive Databases?
4. Mention two features of parallel Databases.
5. Mention two features of Multimedia databases.
6. Define concurrency control.
7. What is Persistence?

### Part B

1. Explain about web database.
2. Give XML representation of bank management system and also explain about Document Type Definition and XML schema.
3. Explain about the following:
  - i. Deductive DB
  - . Spatial DB
4. Briefly discuss client/server model with suitable example.
5. Compare and contrast between mobile databases and internet databases.
6. Explain how to identify active and deductive databases with an example.
7. Write detail note data mining with its various techniques.
8. Explain the different approaches used for object oriented databases.



# SYED AMMAL ENGINEERING COLLEGE

(An ISO 9001: 2008 certified Institution)

Dr. E.M.Abdullah Campus, Ramanathapuram – 623 502.



## Department of Computer Science and Engineering

9. Discuss in detail about structure and various operation of object oriented query language.
10. Explain about the decision trees in the process of data mining.
11. Explain the object oriented database and its approaches.
  
12. Discuss the issues and steps involved in building a data warehouse. How the concept of relational view is related to data warehouse and data marts?