Question Bank

Module 1 – Introduction to database concepts

1. Describe the overall architecture of DBMS with suitable diagram.
2. Give the advantage of DBMS over file system.
3. What do you mean by Database Management system? Why would you choose a database system instead of simply storing data in operating system files?
4. Differentiate between the file processing and database management system.
5. Discuss in detail about the data independence.
6. Explain the roles and responsibilities of the database administrator.
7. What are the different characteristics of database?
8. Give the advantage of DBMS over file system.

Question Bank

Module 2– ER Model

1. Differentiate between Weak and Strong entity sets.
2. Explain with example different types of keys used in ER model.
3. State participation constraints with example.
4. Compare specialization and generalization with disjoint and overlapping constraints.
5. Draw an ER diagram for banking enterprise.
6. Explain various types attributes with example.
7. What is meant by mapping cardinalities? For a binary relationship set what are the possible mapping cardinalities? Illustrate with diagrams.
8. Construct an ER diagram for library system.
9. Draw an E-R diagram for online railway ticket reservation system. Convert it into the tables.
10. Define the following terms with examples
    - Single and Composite attribute
    - Single value and multivalued attributes
    - Entity set
    - Relationship set
    - Aggregation
    - Weak Entity set
    - Ternary relationship
11. Explain the following terms with suitable examples
    - Primary Key
    - Candidate Key
    - Foreign key
    - Super Key
12. Explain the rules for conversion of ER model into Relational model.
13. Draw an E-R diagram for a University database consisting of 4 entities &

    Convert it into tables.

    a. Student b. Department c. Class d. Faculty

    A student has a unique id, the student can enroll for multiple classes Faculty must belong to department and faculty can take multiple classes.
    Every student will get a grade for the class he/she has enrolled.
    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.

Note:- Practice all the ER diagram problems statements from previous university papers.

Question Bank

Module 3 –Relational Model and Relational Algebra

1. Explain following relational algebra operation with examples. How simple Projection operation is different from generalized projection.
    - Select ,Project
    - Natural Join
    - Rename
    - Union, intersection and Set difference
    - Generalized Projection
    - Set intersection
    - Cartesian Product
    - Natural join and types of join
    - Assignment

2. Given the following relations:
   Vehicle(regno,model,color)
   Person(eno,name,address)
   Owner(eno,regno)
   Write expressions in relational algebra to answer the following queries:-
   1. List the regno of vehicles owned by John.
   2. List the names of persons who own maruti cars.
   3. List all the red colored vehicle.

3. Define the following terms:
   1. Entity & entity set
   2. Primary key, candidate, super key, foreign key, mapping cardinality
   3. Weak entity set
   4. Generalization, specialization and Aggregation, Types of attributes

Note:- Practice all the relational algebra queries from previous university papers.

Question Bank

Module 5-Relational Database Design

1. Explain the 1NF, 2NF, 3NF and BCNF with examples.
2. What is decomposition? What are the properties of decomposition?
3. List the conditions for lossless decomposition of relations? Give example.
4. What are the Armstrong axioms of the functional dependencies?
5. List the design goals of the relational database and explain why it is desirable.
6. Company manufactures range of product which is purchased by customers. The schema is given below. Company (comp_code,cname, Directorid,
   Director name {product_name, cost{costid, cust_name, address}} where {……} represents the repeating groups.
   1. State the definitions of 1NF, 2NF and 3NF.
   2. Normalize the above relation to 3NF.

7. Compute the closure of following set F of functional dependencies for relation schema
   R= (A, B, C, D, E, H)

F= {A → BC, CD → E,E → C, D → AEH, ABH → BD, DH → BC} keys

List the Candidates keys for R.

Question Bank

Module 4 –SQL

1.Consider the following schema
S(sid, sname, status, city)
SP(sid, pid,qty)
P(pid,pname,color,weight,city)
Write SQL queries below (using IN and NOT IN)

1) Get supplier name for supplier who supply at least one red part.
2) Get supplier name for supplier who supply who do not supply part P2.

2. Explain DDL, DML and DCL with Examples.

3. Consider the employee database of Figure:

employee (*employee_name*, *street*, *city*)
works (*employee_name*, *company_name*, *salary*)
company (*company_name*, *city*)
manages (*employee_name*, *manager_name*)

a) Find the names and cities of residence of all employees who work for "First Bank Corporation".
b) Find the names, street addresses, and cities of residence of all employees who work for "First Bank Corporation" and earn more than $10,000.
c)Find all employees in the database who do not work for "First Bank Corporation"
Write the **SQL queries** for the above database

4. Write a short note on aggregate functions with examples.

5. What are the different joins in SQL? Explain with examples.

6. What are different types of SQL integrity constraints? Explain with examples.

7. Consider a relation:

Employee(eid, ename,street, city)
Works(eid,cid,salary)
Company(cid,cname,ccity)

a. Modify the database so that jack live in the "Mumbai"
b. Find total number of employee..
c. Find employee name along with its company name.
d. Find the name of employees with highest earning salary.
e. Find the average salary of employee department wise.

8. Write a short note on triggers in databse.

Note: Practice all the SQl queries from Korth Book.

Question Bank

Module 6-Transactions Management and Concurrency

1. Explain Shadow paging in brief.
2. Discuss conflict Serializability and view Serializability with examples.
3. Explain conflict and view Serializability.
4. Explain Log based protocol, shadow paging technique for recovery.
5. Explain the term transaction? Discuss the ACID properties of transactions.
6. What do you mean by concurrency control in database?
7. What are the different states of transactions
8. Describe two- phase locking protocol with example. State its advantages and dis-advantages.
9. Discuss the timestamp ordering protocol with example
10. What is checkpoint?
11. Explain the log based recovery techniques.
12. Define lock? Discuss different types of locks.
13. What do you mean by deadlock? Discuss the deadlock handling techniques in database.