Unit-I Introduction:

Q1. Define DBMS and explain DBMS applications.
Q2. What is data independence?
Q3. Briefly explain about Database system architecture:
Q4. Define Integrity Constraints. Why we need integrity constraints? Explain in detail all constraints.
Q5. What is Data modeling? Explain relational model.
Q6. What is an instance? What is a schema?

Unit-II Formal Relational Query Languagees:Relational Algebra and Relational Calculus

Introduction to SQL:

Q1. Consider the following relational schema

Employee (empno,name,office,age)
Books(isbn,title,authors,publisher)
Loan(empno, isbn,date)

Write the following queries in relational algebra.

a. Find the names of employees who have borrowed a book Published by McGraw-Hill.
b. Find the names of employees who have borrowed all books Published by McGraw-Hill.
c. Find the names of employees who have borrowed more than five different books published by McGraw-Hill.
d. For each publisher, find the names of employees who have borrowed more than five books of that publisher.

Q2. Discuss in detail the operators SELECT, PROJECT and UNION with suitable examples.
Q3. Explain about the following clauses with example queries.

(i) Group by
(ii) Order by
(iii) Aggregation functions

Q4. Give syntaxes to Create and Alter a table.
Q5. Give syntax for DML commands? Show their operations with an example?
Q6. Consider the following tables:
Employee (Emp_no, Name, Emp_city)
Company (Emp_no, Company_name, Salary)

i. Write a SQL query to display Employee name and company name.
ii. Write a SQL query to display employee name, employee city ,company name and salary of all the employees whose salary >10000
iii. Write a query to display all the employees working in “XYZ‟ company

Q7. Consider the following relation schema:

Sailors(sid: integer, sname: string, rating: integer, age: real)
Boat(bid: integer, bname: string, color: string)
Reserves(sid: integer, bid: integer, day: date) Write the following queries in SQL.

(i) Find the average age of the sailor who are eligible for voting for each rating level that has at least two sailors.
(ii) Find the name of sailors who have reserved both red and a green boat.
(iii) Find the sailor_id of sailors who have reserved a red boat

Q8. Where do we need nesting of queries? Give an example.

Q9. Consider the relations:

Suppliers(SID, Sname, Rating)
Parts(PID, Pname, Color)
Catalog(SID, PID, Cost)

i) Retrieve SIDs of Suppliers whose rating > 10.
ii) Retrieve SIDs of Suppliers who supplied red parts.
iii) Retrieve Sname of Suppliers who supplied red parts.

Q10. List out different types of join operations

Unit-III B Tree , B+ Tree Indexing

Q1. Explain how data retrieval, insertion and deletion are done using B tree and B+ tree indices.
Q2. Explain how multi-level indexes are constructed using B trees and B+ trees.
Q3. Why is B+ tree efficient than B tree?

Unit-IV Entity Relationship Model:

Q1. Define E-R model. Explain in detail with suitable example with notational symbols.
Q2. Draw an E – R Diagram for Banking System
Q3. Explain the following terms:

(i) Entity and entity set.
(ii) Attribute and attribute sets.
(iii) Relationship and relationship sets.

Q4. Differentiate between primary key and a candidate key.

Unit-V Relational Database Design:

Q1. Explain 3NF with example and Compare BCNF and 3NF.
Q2. Define BCNF .How does it differ from 3NF.
Q3. Define normalization. Why do we need normalization?
Q4. Define Functional Dependency.
Q5. Define 5NF or Join Dependencies.

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