

1. All questions are compulsory.
2. All questions carry equal marks.
3. Draw neat, labelled diagrams wherever necessary

Q.1 Attempt the following (Any Three)**[15 Marks]**

- a) What is DBMS? Explain any Four Database System Application.
- b) Explain various types of Database Users.
- c) List and explain different levels of Abstraction.
- d) Write a short note on
 - a. Selection
 - b. Union
 - c. Join
- e) Explain various types of Keys used in DBMS.
- f) Explain the DML & DDL with example

Q.2 Attempt the following (Any Three)**[15 Marks]**

- a) List and explain different types of Attributes in ER-models?
- b) Construct an ER diagram for a Hotel Management System. Customer books the room, customer pay amount. Customer uses restaurant for breakfast, lunch and dinner. After checkout, customer leaves the room.
- c) Explain Generalization with proper example
- d) State and explain Codd's 12 rules.
- e) Explain the various Notation for ER diagram.
- f) Explain Class diagram with suitable example.

Q.3 Attempt the following (Any Three)**[15 Marks]**

- a) Explain the Functional dependency.
- b) Write a short note on Lossless join Decomposition
- c) Explain Needs of Normalization.
- d) Explain the concept of Normalization. Also explain 2NF.
- e) Explain the concept of Lossy join Decomposition.
- f) Consider following un-normalized data.

Cust_id	Cust_name	Cust_phone	Description	Order no
C0101	Sanvi	841236985, 963214587	Notebook, pen	ON001
C0102	Viraj	852369741, 987456321	Pencil, Eraser	ON002
C0103	Priti	753421896	Marker	ON003

Find out First Normal Form (1NF).

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Q.4 Attempt the following (Any Three)

[15 Marks]

- Write a short note on Views.
- Explain the different Aggregate Function with proper example.
- What is Index? Explain Primary Index and Secondary Index.
- Consider following tables:
Employee (empid, name, dateofJoining, city)
EmployeeSalary (empid, project, salary)
and write queries for following:
 - Find the employee id whose salary lies in the range of 35000 and 55000.
 - Display the empid, name that are present in employee but not in employeeSalary.
 - Find the maximum, minimum, average salary of the employees.
 - Display total number of employees living in same city.
 - Display all those employees who work on project other than P3.
- What is Join? Explain type of Join.
- Write note on:
 - Group By
 - Having Clause

Q.5 Attempt the following (Any Three)

[15 Marks]

- Explain States of Transaction.
- Explain the concept of Serializability and explain in detail view Serializability.
- What is Deadlock? How you can prevent the Deadlock?
- Describe ACID properties for Transaction
- Explain the Two-phase locking protocol (2PL).
- Explain Undo and Redo phase in Aries Algorithm.