

(i) Printed Pages : 4 Roll No.

(ii) Questions : 9 Sub. Code :

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Exam. Code :

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PGDCA 1st Semester

(2125)

DATABASE MANAGEMENT SYSTEM

Paper : PGD-1103

Time Allowed : Three Hours] [Maximum Marks : 60

Note :— Attempt **FIVE** questions in all selecting **ONE** question each from Units - I, II, III, IV and Question No. 1 is compulsory.

(Compulsory Question)

1. Write in short:

(i) What are Null values?

(ii) Views in SQL?

(iii) What are constraints and its types?

(iv) Define MAC and DAC.

(v) Differentiate between Relational Algebra and Relational Calculus.

(vi) Discuss the role of the commands COMMIT and ROLLBACK with suitable examples. 2×6=12

UNIT-I

2. (a) What is DBMS? Explain the components of DBMS and how it differs from traditional file system. 6
- (b) Discuss the three-level architecture of DBMS. Explain how it leads to data independence. 6
3. (a) With the help of an example, explain the steps involved in the conceptual design of a relational database using the Entity-Relationship (E-R) model. Discuss how entities, attributes, and relationships are represented in an E-R diagram. 6
- (b) What is a Distributed Database System? Discuss its structure, design considerations, and advantages over centralized databases. Include a diagram to support your explanation. 6

UNIT-II

4. (a) Discuss the major data security risks and password-related threats in database systems. Suggest preventive measures that can be implemented to mitigate these risks. 6
- (b) What is FD? Explain the role of FD in the process of normalization. 6
5. (a) Discuss various causes of database failures. Explain how the database recovery process handles these failures to ensure atomicity and durability of transactions. 6
- (b) What are candidate keys, primary keys, and foreign keys? Illustrate their roles in ensuring data integrity and establishing relationships among tables with a practical example. 6

UNIT-III

6. (a) Define any three-character functions and any three date functions used in SQL. Write example queries using these functions to illustrate their working. 6
- (b) What are the different data types in SQL? Compare CHAR vs VARCHAR and DATE vs TIMESTAMP with examples, and explain how choosing the right data type affects storage and performance. 6
7. (a) Consider a table SALES (Sale_ID, Product_Name, Quantity, Price, Sale_Date). Write SQL queries to:
- (i) Display total sales amount (Quantity * Price) for each product.
 - (ii) Display product-wise average quantity sold.
 - (iii) Display sales made in the month of June 2024, ordered by total sales amount in descending order. 6
- (b) Differentiate between creating a table with data from another table and inserting values into an existing table. Give SQL examples for both and discuss scenarios where each approach is more appropriate. 6

UNIT-IV

8. (a) Explain the concept of Views in SQL. Discuss at least four advantages of using views in database systems with suitable examples where a view would be preferred over a base table. 6

- (b) Define the term Transaction in SQL. Explain the importance of transaction control in maintaining data consistency. 6
9. (a) Explain various types of set operators with help of example. Write the usage of set operators. 6
- (b) What are Outer Joins? Explain the three types—Left Outer Join, Right Outer Join, and Full Outer Join—with appropriate examples. Discuss when and why each type would be used in a query. 6