

SAMPLE PAPERS
DIPLOMA THIRD SEMESTER EXAMINATION 2025 (JUT)
DATABASE MANAGEMENT SYSTEM CONCEPTS AND PL/ SQL
DIPLOMA WALLAH

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Full Marks: 70 | **Time:** 3 Hours

Instructions: * Answer **five** questions in total.

- **Question No. 1** is compulsory.
- Answer any **four** questions from the remaining (Q2 to Q7).
- All questions carry equal marks.

Q1. Choose the correct alternative of the following: (2 × 7 = 14 Marks)

- (i) The intersection of a row and column is called a:
- (a) Data
 - (b) Field
 - (c) Cell
 - (d) Value
- (ii) Which attribute can be divided into smaller sub-parts?
- (a) Simple Attribute
 - (b) Composite Attribute
 - (c) Single-valued Attribute
 - (d) Stored Attribute
- (iii) Which operation performs a set union of two "similar" tables?
- (a) JOIN
 - (b) UNION
 - (c) CARTESIAN PRODUCT
 - (d) DIVISION
- (iv) A "Foreign Key" constraint is used to enforce:
- (a) Entity Integrity
 - (b) Referential Integrity
 - (c) Domain Integrity
 - (d) User-defined Integrity
- (v) In SQL, the wildcard character % represents:

- (a) One character
 - (b) Zero or more characters
 - (c) Specifically three characters
 - (d) A NULL value
- (vi) Which of the following is not a valid state of a transaction?
- (a) Active
 - (b) Partially Committed
 - (c) Done
 - (d) Failed
- (vii) The DESC command in SQL is used to:
- (a) Sort data descending
 - (b) Describe table structure
 - (c) Delete a table
 - (d) Disconnect from DB

Q2. (7 + 7 = 14 Marks)

- (a) Explain and differentiate clearly between 1NF, 2NF, and 3NF with examples.
- (b) Explain the various Constraints in a relational model, focusing on Entity Integrity and Referential Integrity.

Q3. (7 + 7 = 14 Marks)

- (a) What is the necessity of JOIN operations? Explain the working and syntax of INNER JOIN, LEFT JOIN, and RIGHT JOIN.
- (b) Explain the basic structure of a PL/SQL block. Describe the use of variables, datatypes, and control statements (decision making) in PL/SQL.

Q4. (7 + 7 = 14 Marks)

- (a) Explain the ACID properties of a transaction.
- (b) Explain the use of Transaction Control Commands (COMMIT, ROLLBACK, and SAVEPOINT) in managing the state of data modification.

Q5. (7 + 7 = 14 Marks)

- (a) Describe the Entity-Relationship (ER) model. Explain the classification of entities and relationships, and differentiate between the various types of Attributes.
- (b) Explain the concept of a Subquery. Write an example of a query using a Correlated Subquery or the EXISTS/NOT EXISTS operator.

Q6. (7 + 7 = 14 Marks)

- (a) Explain the roles and responsibilities of a Database Administrator (DBA).
- (b) Define Normalization. Explain the need and importance of normalization in database design and discuss Design Anomalies.

Q7. Write short notes on any four: ($3.5 \times 4 = 14$ Marks)

- (a) DCL (Grant/Revoke)
 - (b) Multi-valued Attributes
 - (c) Right Outer Join
 - (d) Isolation Property (ACID)
 - (e) PL/SQL Control Statements
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SOLUTIONS FOR PAPER 3

MCQ Answer Key:

- (i) (c) Cell (or Field Value)
- (ii) (b) Composite Attribute
- (iii) (b) UNION
- (iv) (b) Referential Integrity
- (v) (b) Zero or more characters
- (vi) (c) Done (Valid states: Active, Partially Committed, Committed, Failed, Aborted)
- (vii) (b) Describe table structure (Note: ORDER BY ... DESC sorts, but standalone DESC table_name describes structure).

Short Answer Hints (Q7):

- **(a) DCL:** Commands to control access. GRANT gives permission, REVOKE takes it back.
- **(b) Multi-valued Attributes:** An entity can have multiple values for this attribute (e.g., Phone Numbers). Represented by a double oval.
- **(c) Right Outer Join:** Returns all records from the Right table, and the matched records from the Left table.
- **(d) Isolation:** Ensures concurrent transactions don't interfere; effectively executing as if they were sequential.
- **(e) PL/SQL Control Statements:** IF-THEN-ELSE, CASE, LOOP, WHILE, FOR loops used for program logic flow.

Model Long Answer (Q4a - ACID):

- **A (Atomicity):** Transaction is an indivisible unit.
- **C (Consistency):** Database transitions from one valid state to another.
- **I (Isolation):** Transactions are securely independent.
- **D (Durability):** Committed data is saved permanently.