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) Which of the following is NOT a type of SQL Constraint?

(a) PRIMARY KEY

(b) FOREIGN KEY

(c) ALTERNATE KEY

(d) SELECT KEY

(ii) The specific request made to the database to retrieve data is called a:

(a) Trigger

(b) Query

(c) Report

(d) Form

(iii) If a table has two candidate keys, and one is chosen as Primary Key, the other is called:

(a) Foreign Key

(b) Secondary Key

(c) Alternate Key

(d) Composite Key

(iv) The process of decomposing a table to remove redundancy is called:

(a) Normalization

(b) Denormalization

(c) Fragmentation

(d) Replication

(v) Which PL/SQL section is optional?

(a) Declaration

(b) Execution

(c) Exception Handling

(d) Both (a) and (c)

(vi) In the 3-Tier Architecture, the middle layer is:

(a) Database Server

(b) Application Server

(c) Client

(d) User Interface

(vii) COUNT(*) returns:

(a) Number of distinct values

(b) Number of rows including NULLs

(c) Number of rows excluding NULLs

(d) Sum of values

Q2. (7 + 7 = 14 Marks)

(a) Explain the roles and responsibilities of a Database Administrator (DBA). Differentiate between the view of data at the physical, conceptual, and external levels.

(b) Define Functional Dependency. Discuss its importance and explain the rules/properties associated with it.

Q3. (7 + 7 = 14 Marks)

(a) Discuss the purpose of Aggregate Functions (COUNT, SUM, AVG, MIN, MAX). Explain their use along with GROUP BY and HAVING clauses.

(b) Explain the concept of a Subquery. Differentiate between Single-Row and Multiple-Row Subqueries with examples.

Q4. (7 + 7 = 14 Marks)

(a) What is a View? Write the SQL commands to create, drop, and update a view. Explain how DCL commands are used to manage user access.

(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) Explain the concept, syntax, and structure of Stored Procedures and Functions in PL/SQL. What is the difference between them?

(b) Explain the process of translating an ER diagram to a Relational Model, ensuring all constraints are verified.

Q6. (7 + 7 = 14 Marks)

(a) Discuss and illustrate the different types of DBMS Architectures (specifically two-tier and three-tier).

(b) Explain the different types of Database Languages (DDL, DML, DCL, TCL). Provide syntax and examples for DML commands (INSERT, UPDATE, DELETE).

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

(a) Derived Attributes

(b) 3NF (Third Normal Form)

(c) Correlated Subquery

(d) SAVEPOINT

(e) Stored Procedures

SOLUTIONS FOR PAPER 2

MCQ Answer Key:

(i) (d) SELECT KEY

(ii) (b) Query

(iii) (c) Alternate Key

(iv) (a) Normalization

(v) (d) Both (a) and (c)

(vi) (b) Application Server

(vii) (b) Number of rows including NULLs

Short Answer Hints (Q7):

- **(a) Derived Attributes:** Values calculated from other attributes (e.g., Age derived from DOB).
- **(b) 3NF:** A table is in 3NF if it is in 2NF and has no transitive dependency.
- **(c) Correlated Subquery:** A subquery that uses values from the outer query; executed once for each row processed by the outer query.
- **(d) SAVEPOINT:** A marker within a transaction that allows partial rollback.
- **(e) Stored Procedures:** Named PL/SQL blocks stored in the database to perform specific tasks; can be called by applications.

Model Long Answer (Q5a - Procedures vs Functions):

- **Procedure:** May or may not return a value; called as a standalone statement; used for executing business logic actions.
- **Function:** Must return a value; called as part of an expression; used for computations.
