Q.P. Code : **12925**

(2½ Hours) [Total Marks : 75

N.B. : (1) All questions are **compulsory**.
    (2) **Figures** to the **right** indicate **full** marks.
    (3) **Illustrations** in-depth **answers** and **diagrams** will be appreciated.
    (4) Mixing of sub-questions is not allowed.

1. Attempt the following (any **three**)   15
   (a) State and explain the four important properties of a transaction.
   (b) Explain with the help of an example, in which normal forms the Functional Dependency and Multivalued Dependency occur.
   (c) Write a note on the Phantom Update Problem.
   (d) "Every Serializable Schedule is not conflict serializable." Explain with an example.
   (e) Explain the usage of the Precedence Graph with the help of an example.
   (f) Explain the following :

      (i) Lossless - Join Decomposition

      (ii) Dependency - Preserving Decomposition.

2. Attempt the following (any **three**)   15
   (a) What is ARIES ? Explain its phases.
   (b) With the help of a diagram, explain the 2 Phase Locking protocol.
   (c) Write a note on Recovery Manager.
   (d) State the different recovery related structures. Explain any two of them in brief.
   (e) Define deadlock. State and explain the different policies for preventing a deadlock.
   (f) What is the difference between optimistic and pessimistic concurrency control. State the three phases in optimistic concurrency control.

3. Attempt the following (any **three**)   15
   (a) State the data types in PL/SQL with example, how variables can be declared in PL/SQL.
   (b) With the help of an example, explain the Loop-End Loop statements of PL/SQL.
   (c) Write a short note on nested table.
   (d) What is the role of NULL values in PL/SQL ?

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(e) Write a PL/SQL block that accepts the owner name from the user. The user name can be SYS, SYSTEM, HR or SCOTT. The username can be SYS the print the result as "Owner is SYS". If it is SYSTEM, then print the result as "Owner is SYSTEM" and so on. Write the code using CASE Statement.

(f) Write a PL/SQL block to find the square of a number which is accepted from the table square (num, sq) and store it under sq in the given table.

4. Attempt the following (any **three**)   15
    (a) What is cursor ? State and explain the types of cursor.
    (b) What is metadata ? What metadata is stored in system catalog ? Describe the information stored per relation.
    (c) With the help of a diagram explain the stages of a Query Optimization Plan.
    (d) What are commit, savepoint and rollback ? Explain their usage with examples.
    (e) Explain how read only transactions are defined. Explain the different locking strategy models.
    (f) Assuming a table products (p-no, p-name, p-stock, p-price). State and explain the queries to generate the p-no using sequence. Also explain how to display the next generated and current value of the sequnce.

5. Attempt the following (any **three**)   15
    (a) Explain the concept of RW and WW conflicts.
    (b) What is log file ? List for which different actions in a database log record will be updated.
    (c) Write a note on the Logical Operaters in PL/SQL.
    (d) Explain the difference between cursor for loops and parameterized cursors.
    (e) State and justify Thomas Write Rule.
    (f) State and explain the artributes of a cursor.