(2 ½ Hours)   **[Total Marks: 75]**

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

Q1.   **Attempt the following (any THREE):**   **(15)**

    (A)   Explain Armstrong's Axioms. Apply it on the relation R with R= ABCDEGH with FD F^+= {AB → C, AC → B, AD → E, B → D, B → G}.

    (B)   Briefly explain example of lossy decomposition. Also define Lossless Join Decomposition.

    (C)   Write a short note on Fourth normal form.

    (D)   What is D stands in ACID property? What is importance of D? Explain with example how D is achieved?

    (E)   Define serial schedule and Serializable schedule. State in brief anomalies cause due to interleaved execution.

    (F)   What is precedence graph? Explain how a precedence graph can be draw for any schedule S.

Q2.   **Attempt the following (any THREE):**   **(15)**

    (A)   State and explain rules of Strict Two-Phase Locking protocol.

    (B)   Write a short note on The Thomas Write Rule.

    (C)   What is deadlock? Briefly explain deadlock prevention mechanism.

    (D)   List entries of transaction and dirty page table along with instance of log file. Explain with suitable example.

    (E)   What is write ahead log protocol? Explain in brief.

    (F)   Explain in detail Analysis phase in detail with suitable example.

Q3.   **Attempt the following (any THREE):**   **(15)**

    (A)   What are packages? State the advantages packages.

    (B)   Write a short note on package specification.

    (C)   Develop a simple package to display details of a specified employee Id from a employee table.

    (D)   State the difference between Static and dynamic SQL. State advantages of Static SQL over a dynamic SQL.

    (E)   Write a short note on DBMS SQL Package.

    (F)   List different types of applications where dynamic queries are necessary.

Q4.   **Attempt the following (any THREE):**   **(15)**

    (A)   State & explain with example the applications of triggers.

    (B)   Describe use of indexing in DBMS. What are its advantages.

    (C)   Write a short note on Tree-based Indexing.

    (D)   Write a short note on Instead of Trigger.

    (E)   Compare between statement-level and Row-level Trigger.

    (F)   Explain with example clustered index organization.
          -Using Range Query.
          -For Equality.

Q5.   **Attempt the following (any THREE):**   (15)

(A)   Write a short note on Conflict serializability.

(B)   Write a short note on fifth normal form.

(C)   Explain in brief upgrading and down grading locks.

(D)   What is check point? What does checkpoint do? State the importance of checkpoint.

(E)   Write a syntax for creating
       -Simple index.
       -Unique index.
       -Function base index.

(F)   What is Trigger? Differentiate between disabling trigger and removing trigger.

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