

(3 Hours)

[Total Marks : 100

- N.B. (1) Question No. 1 is compulsory.
(2) Solve any **three** questions out of the remaining questions.
(3) Make **suitable** assumptions if **needed**.

1. (a) Define Specialization and Generalization with an example. 5
(b) Write about Aggregate Functions in SQL. 5
(c) Discuss Referential Integrity Constraints. 5
(d) Explain Total Participation and Partial Participation with example. 5
 2. (a) Explain the following Relational Algebra Operations with example :— 10
(i) Set Intersection (iii) Generalized Projection
(ii) Division Operator (iv) Natural join
(b) Draw an ER Diagram for a banking enterprise. Convert it into relational model. 10
 3. (a) What is Normalization ? Explain 1NF, 2NF, 3NF and BCNF giving examples. 10
(b) What is an attribute ? Discuss various types of attributes with examples. 10
 4. (a) Explain sort-merge join algorithm in query processing. 10
(b) Describe conflict serializability and view serializability with examples. 10
 5. (a) Explain database system architecture in detail. 10
(b) What do you mean by Data Modeling ? Discuss different types of Models. 10
 6. Write Short notes on :— 20
(a) ACID Properties
(b) Steps in Query Processing
(c) Data Control Commands in SQL
(d) Security in Database.
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