

Roll No.

Total Pages : 3

45169

BT-5/D-25

DATABASE MANAGEMENT SYSTEMS

Paper : PC-CS-301A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *five* questions in all, by selecting at least *one* question from each unit. All questions carry equal marks.

UNIT-I

1. (a) Describe and compare Network, Hierarchical, and Relational data models. Illustrate each model with an example. (8)
(b) Discuss the roles and responsibilities of a Database Administrator (DBA). (7)
2. (a) Discuss the Three-Schema Architecture of a DBMS. Draw a clear diagram showing the interaction between the internal, conceptual, and external levels. (8)
(b) Explain simple, composite, derived and multi-valued attributes with suitable examples. (7)

UNIT-II

3. Explain the following :
- (i) Aggregate functions.
 - (ii) Joins.
 - (iii) Database Constraints. (15)
4. (a) Differentiate between DDL, DML, and DCL commands in SQL. Provide suitable examples of each and explain their roles in database management. (8)
- (b) Differentiate between Relational Algebra and Relational Calculus. (7)

UNIT-III

5. (a) What is normalization? Explain insertion, deletion, and updation anomalies that can occur in poorly designed databases. Illustrate each with an example. (8)
- (b) How is 3NF different from BCNF? Justify your answer using suitable example. (7)
6. (a) Explain the different types of physical data storage structures used in RDBMS. (8)
- (b) What is lock-based protocols? Explain two-phase locking (2PL) technique with suitable example. (7)

UNIT-IV

7. (a) Explain the different recovery techniques used in RDBMS. How do these techniques help in maintaining database consistency after failures? (8)
- (b) What is serializability? Explain serial and non-serial schedules with example. (7)
8. Write short notes on : (15)
- (i) Concurrency control.
 - (ii) ACID properties.
 - (iii) Transaction states.