Exam. Code: 0919
Sub. Code: 6457

2123

B.E. (Computer Science and Engineering)
Seventh Semester
CS-702: Advance Database Systems

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

a) Give differences in ROLAP, MOLAP and HOLAP.

b) How SQL3 differs from SQL2.

c) Compare Microsoft SQL Server, My SQL, Oracle.

d) What are UDTS?

e) Compare Log base recovery and shadow paging. (5x2)

UNIT - I

II. a) Design a normalized database schema for a large corporation's Employee Management System. The initial schema includes attributes like EmployeeID, EmployeeName, DepartmentID, DepartmentName, Position, SupervisorID, JoiningDate, and Salary. Apply the normalization process to achieve First Normal Form (1NF), Second Normal Form (2NF), Third Normal Form (3NF), Boyce-Codd Normal Form (BCNF), Fourth Normal Form (4NF), Fifth Normal Form (5NF), and Sixth Normal Form (6NF). Clearly outline the steps for each normalization level, providing the modified schema at each stage. Additionally, identify and address potential update anomalies existing in the original schema, ensuring the modifications align with the practical needs of a corporate Employee Management System.

b) Explain Forward and Backward Recovery techniques. (7,3)

III. a) Define KDD and elaborate on its significance in data exploration. (3)

b) Evaluate and differentiate various data mining techniques, providing insights into their unique characteristics and respective applications. (4)

c) Outline the comprehensive architecture of a Data Warehouse, emphasizing the key components and their interrelationships. (3)

IV. Create an object model for a Library Management System. The system needs to handle diverse book categories, member registrations, and book borrowing records. Additionaily, consider the availability of multiple copies for each book, due dates, and late fees.

Contd.....P/2

a) Design an ODL schema reflecting the key entities and their relationships.

b) Write 2 OQL operations to showcase the system's functionality, such as finding available copies of a book or retrieving a member's borrowing history.

Ensure your design covers the essential aspects of library management, and the OQL operations demonstrate practical use cases within the system. (10)

UNIT - II

V. a) Compare various concurrency control techniques on the basis of Conflict serializability, Deadlock avoidance, Recoverability and Cascadeless Ness with the suitable example.

b) Explain functionality of 2-phase commit and 3-Phase commit protocols for recovery in distributed databases. How both responds to the following failures:

i)Failure of participating site

ii)Failure of Coordinator (2x5)

VI. a) Give various query processing phases.

b) Explain various cost optimization techniques by elaborating each with an example.

c) Give cost functions for select and join. (3,3,4)

VII. a) Discuss the diverse architectures of Distributed Databases, detailing their operational frameworks.

b) Contrast and compare different strategies for data distribution in Distributed Databases, emphasizing their respective strengths.

c) Explain the functioning of Distributed Query Processing (DQP), outlining its essential processes. (4,4,2)

x-x-x