(b) Compare Object-Oriented Databases and Object-Relational Databases with respect to structure, functionality, and applications. 7

9. (a) Explain how inheritance is supported in Object-Oriented Databases using specialization and generalization. 7

(b) Discuss the advantages and limitations of Object-Relational Databases in handling complex data types. 7

❖❖❖❖❖❖❖

(T) Roll No. .....

PAPER ID—11453

B.Tech. EXAMINATION, 2026

(Sixth Semester)

PROFESSIONAL ELECTIVE COURSE-II

ADVANCE DATABASE MANAGEMENT SYSTEM

Time : 3 *Hours* *Maximum Marks* : 70

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all. Q. No. **1** is compulsory. Attempt any *four* questions selecting *one* question from each Unit. All questions carry equal marks.

1. Attempt all the subparts.

(a) Define primary key and foreign key. 2

(b) What is functional Dependency ? 2

(c) Differentiate between undo and redo operations. 2

(d) What is a deadlock in DBMS ? 2

(e) Define data replication. 2

(f) What is a commit protocol ? 2

(g) What is the difference between object identity and object equality ? 2

Unit I

2. (a) Describe the three-schema architecture. Why do we need mapping among schema levels ? How do different schema definition languages support this architecture ? 7

(b) The tourism department wishes to computerize its data. The information consists of tourist details and monuments of tourist interest, their location and history. Monuments are classified according to historical, religious and architectural importance. The list of facilities available at each spot is also available. They include (i) living accommodation in terms of hotels, their names, categories and the number of rooms available and (ii) local transport facilities in terms of service provider name, tours with their tariff and timing. Create an ER/EER diagram for the above database scenario including all integrity constraints, cardinalities and participation constraints. State any assumptions considered by you. 7

3. You have been hired as a database administrator for a food delivery platform similar to Zomato or Swiggy. The system manages restaurants, customers, orders, delivery details, and reviews. The platform allows users to browse restaurants, place orders, and rate their experience.

Consider the following relational database schema:

(i) Restaurant (RestaurantID, Name, Location, Cuisine, Rating)

(ii) Customer (CustomerID, Name, Email, Address, Phone)

(iii) Order (OrderID, CustomerID, RestaurantID, OrderDate, TotalAmount)

(iv) OrderItems (OrderID, ItemName, Quantity, Price)

(v) Delivery (DeliveryID, OrderID, DeliveryTime, Status)

(vi) Review (ReviewID, CustomerID, RestaurantID, Rating, Comment)

Write relational algebra and SQL queries for the following:

(a) List all customers who have never placed any order.

(b) Find the names of customers who have placed orders with a total amount greater than 1000.

(c) Retrieve the total number of items ordered by each customer who has placed at least one order from a restaurant with rating above 4.0.

(d) List all customers who have ordered from a restaurant serving 'Italian' cuisine and have given a rating of 5 to any restaurant.

14

Unit II

4. (a) Explain the concept of database recovery in a centralized DBMS. Discuss how system failures affect transactions and how recovery techniques restore consistency. 7

   (b) Discuss different logging schemes used in DBMS. Compare immediate update and deferred update techniques. 7

5. (a) What is a schedule in DBMS ? Explain different types of schedules and their properties. 7

   (b) Explain multi-version concurrency control (MVCC). How does it improve performance in a multi-user environment ? 7

Unit III

6. (a) What are the key considerations in the design of parallel databases ? Explain with suitable examples. 7

   (b) What is data transparency in distributed databases ? Explain different types of transparency mentioning their advantages and challenges. 7

7. (a) Describe parallel query evaluation techniques. How do they improve system performance ? 7

   (b) Explain distributed transaction management. How is concurrency control handled in a distributed environment ? 7

Unit IV

8. (a) Explain the architecture of Object-Oriented Databases Management System (OODBMS). Highlight its key components. 7