

GUJARAT TECHNOLOGICAL UNIVERSITY
MBA-SEMESTER-I-EXAMINATION-WINTER-2024

Subject Code: MB01096021

Date: 17/01/2025

Subject Name: Relational Database Management System

Time: 10:30 AM TO 01:30 PM

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Use of simple calculators and non-programmable scientific calculators are permitted.**

Q.1 (a) Give definition of following terms: **14**

1. Data Dictionary
2. Data Language
3. Single Entity Instance
4. Unique Constraint
5. Function
6. Logical Schema
7. Key

Q.2 (a) Differentiate between data and information. Provide examples of how data can be converted into useful information in the context of business operations. **07**

(b) Imagine you are managing the employee payroll system using a file-based approach. What challenges would you face in maintaining data integrity and ensuring efficient querying of employee records? How would a DBMS resolve these issues? **07**

OR

(b) You are tasked with setting up a DBMS for a retail business. What are the steps involved in the process of setting up the DBMS for inventory management? **07**

Q.3 (a) Define the concept of a data model in a DBMS. Discuss the significance of the Entity-Relationship (E-R) Model in database design, and explain its key components. **07**

(b) Explain the different types of relationships in a database. Provide examples of each relationship type in the context of an online store. **07**

OR

Q.3 (a) You are tasked with migrating data from a hierarchical database model to a relational database model. What steps would you take to ensure data integrity and avoid loss of data during the migration process? **07**

(b) In a library management system, identify at least five entities (such as "Book," "Author," "Member") and their associated attributes (e.g., "Book" may have **07**

attributes like ISBN, title, and publication year). Create an E-R diagram to represent these entities and their relationships.

- Q.4 (a)** Explain the structure of relational data in a database. How are data organized in a relational model, and what are the key components of a relational table? **07**
- (b)** What is relational data manipulation? Discuss how SQL is used to manipulate relational data, with examples of common SQL commands like SELECT, INSERT, UPDATE, and DELETE. **07**

OR

- Q.4 (a)** Describe a scenario where you would use SQL for managing a company's employee records. What SQL features would you use for querying, updating, and deleting data from the employee table? **07**
- (b)** What is view in SQL? Explain the advantages of using views, and describe how views can be created, used, and updated in a relational database. **07**

- Q.5** An online bookstore requires a comprehensive database to efficiently manage various aspects of its business operations, including book inventory, customer information, order processing, and payment systems. The goal is to offer customers an easy way to browse books, make purchases, and track their orders. Additionally, the database needs to support efficient reporting on key metrics such as sales, inventory levels, and customer preferences. The bookstore offers a wide variety of books and requires data storage for critical information, including ISBN, title, author(s), category, price, and stock quantity for each book. Customer details, such as name, email, phone number, and shipping address, also need to be stored. Each order may consist of multiple books with associated quantities and prices, and every order must be linked to a customer. The system must be capable of processing payments through different methods, including credit cards and PayPal. Furthermore, the database should manage discounts and promotional offers, which may apply to specific book categories or seasonal sales. Lastly, the system should generate reports on inventory levels, sales data, and customer purchasing behavior to support business decisions. **14**

To address these needs, the database design must be structured and scalable, allowing for seamless handling of large amounts of data. This involves normalizing the design to reduce redundancy and improve data efficiency. The database schema would include entities such as Books, Authors, Customers, Orders, Payment Methods, and Categories, with appropriate keys and relationships between these entities. In terms of relational operations, the database must support essential SQL functions like

SELECT, JOIN, INSERT, UPDATE, and DELETE to manage and query the data effectively.

(a) What steps would you take to normalize the database design for the online bookstore? **07**
Explain how normalization helps in minimizing redundancy.

(b) Identify the entities, attributes, and relationships that should be included in the database design for the online bookstore. How would you implement foreign key relationships? **07**

OR

Q.5 (a) Design a set of SQL queries for reporting inventory levels, sales data, and customer purchase history. **07**

(b) What are the challenges in integrating a payment system like PayPal into the database design, and how would you address those challenges in the design? **07**
