

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
MBA - SEMESTER - I EXAMINATION - WINTER 2025

Subject Code: MB01096021

Date: 19-01-2026

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.**

	Marks
Q.1 ALL 7 Questions must be Compulsory.	14
(a) Tuple	
(b) Integrity	
(c) Multivalued Attribute	
(d) Foreign key	
(e) DBMS	
(f) Redundancy	
(g) Data Abstraction	
Q.2 (a) Evaluate the conceptual differences between ‘data’ and ‘information’. Based on your understanding, justify why modern systems rely on databases rather than ‘informationbases’. Support your argument with examples from real-world applications.”	07
(b) Discuss different types of DDL and DML statements in detail.	07
OR	
(b) Briefly explain the three-level architecture of DBMS.	07
Q.3 (a) Elaborate on different types of attributes in the ER-Diagram and explain them with an example of each.	07
(b) Define the term Relation in an ER-Diagram. Explain cardinality ratios with an example of each.	07
OR	
(a) Discuss participation constraints with an example of each.	07
(b) Explain the step-by-step process of transforming an Entity-Relationship (ER) model into a relational model. Your answer should include how entities, relationships, attributes (including multivalued and composite), and constraints are handled during the transformation.	07

Q.4 (a) Define the concept of functional dependency in the context of relational databases. Differentiate between trivial and non-trivial functional dependencies, and illustrate each type with a relevant example. Analyse how recognizing these dependencies influences normalization and database design. **07**

(b) What are axioms? Discuss Armstrong axioms in brief. **07**

OR

(a) Explain the concepts of super key, candidate key, and primary key in the context of relational databases. Provide a suitable example of a relation (table) and identify each of these keys within it. Justify how they differ in terms of uniqueness and minimality. **07**

(b) Discuss the 2nd Normal form in detail with an example. **07**

Q.5 Consider the following tables, and write the SQL statements for the given problems:

Books (BID, Title, Author, Publisher, Publishing_Year)

Members(MID, Name, Email, Membership_date)

Loans(LID, BID, MID, Loan_date, Return_date)

(a) Write a SQL query to create the tables and insert one record in each table. **07**

(b) Consider the tables given above in Question 5[A] and write the SQL statement to perform the following: **07**

1. Display the names of members who have borrowed more than 3 books.
2. List all books that were published after 2015 and are in the "Technology" category.
3. Find the total number of books borrowed by each member

OR

(a) Identify the normal form R(ABCDE) with the following set of functional dependencies, and if it is not in BCNF, then decompose the relation up to BCNF. **07**

R (A, B, C, D, E, F)

ABC → D

ABD → E

CD → F

CDF → B

BF → D

(b) Find the candidate keys from the given relation: **07**

R (ABCDEF)

AB → C

CD → AE

E → F
