GUJARAT TECHNOLOGICAL UNIVERSITY

MCA – SEMESTER I- EXAMINATION –SUMMER-2025

Subject Code: MC01094031   **Date: 04/06/2025**
Subject Name: Relational Database Management Systems
Time:10:30 AM TO 01:00 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)**	**Answer the following.**	
		1. Explain advantages of using DBMS Approach.	**03**
		2. Explain recursive relationship set with example.	**02**
		3. Justify the need of aggregation in ER model.	**02**
	(b)	Discuss classification of database management systems.	**07**
Q.2	**(a)**	Briefly discuss the role of DBA.	**07**
	(b)	Design an ER diagram for a database application of your choice. Specify all constraints that should hold on the database. Make sure that the schema has at least five entity types, four relationship types, a weak entity type and a superclass/subclass relationship.	**07**

OR

	(b)	Explain generalization and specialization with suitable example.	**07**
Q.3	**(a)**	Consider a relation R(A, B, C, D, E) with the following dependencies:	**07**

$$AB \rightarrow C, CD \rightarrow E, DE \rightarrow B$$

     Is AB a candidate key of this relation? If not, is ABD? Explain your answer.

	(b)	Define constraints. Explain relational model constraints in brief.	**07**

OR

Q.3	**(a)**	Discuss insertion, deletion, and modification anomalies. Illustrate with examples.	**07**
	(b)	Consider the following relation for published books with FDs: BOOK (Book_title, Author_name, Book_type, List_price, Author_affil, Publisher)	**07**

        Book_title → Publisher, Book_type
        Book_type → List_price
        Author_name → Author_affil
    Normalize the relation up to 3rd NF.

Q.4	**(a)**	Draw a transaction state diagram and discuss the typical states that a transaction goes through during execution.	**07**
	(b)	Discuss BCNF and 4NF in brief.	**07**

OR

Q.4	**(a)**	Discuss why concurrency control is needed in transaction processing.	**07**
	(b)	Explain conflict serializability in detail.	**07**

Q.5 **(a)** Define transaction. Explain ACID properties of transaction.   **07**

(b) Explain transaction control commands.   **07**

OR

Q.5 **(a)** Consider the following tables and answer the queries in   **07**

        Books (isbn_no, title, publisher_id, year)

        Authors (author_id, author_name, country, city)

        Publishers (publisher_id, publisher_name, city)

        WrittenBy (isbn_no, author_id)

1) List all the books published after 2000.

2) Update the city of author to Delhi whose author id is 15.

3) List all the book titles written by author Mitchell.

4) Add column price in the table Books.

5) Display number of Publishers from the city Ahmedabad.

6) List all the books published by McGaw Hill.

7) Display all publishers in the ascending order of their name.

(b) Explain View Serializability with example.   **07**

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