Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III EXAMINATION – SUMMER 2025

Subject Code:3130703 Date:31-05-2025

Subject Name:Database Management Systems

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

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

			MARKS
Q.1*	**(a)**	Explain Logical & Physical data independence supported by DBMS	**03**
	(b)	Explain different types of users of DBMS.	**04**
	(c)	Compare database approach with traditional file systems to store application data.	**07**
Q.2	**(a)**	Explain Three Layer Schema Architecture of DBMS.	**03**
	(b)	Explain Specialization, Generalization and Categorization in EER Modeling.	**04**
	(c)	Explain Following Constraints supported by RDBMS: 1. Primary Key 2. Foreign Key / Referential Integrity Constraints 3. Entity Integrity 4. Domain Constraint	**07**
		OR	
	(c)	Explain Relational Algebra Operations in detail.	**07**
Q.3	**(a)**	Explain Recursive Relationship in ER Modeling with example.	**03**
	(b)	Explain Cardinality Ratio and Participation constraint of ER Model.	**04**
	(c)	What is the need to normalize data? Explain 1NF, 2NF & 3NF in detail.	**07**
		OR	
Q.3	**(a)**	Explain ACID Properties of transaction with appropriate example.	**03**
	(b)	Consider a relation R(A,B,C,D,E) with following dependencies: AB-→C, CD-→E, DE-→B . Is ABD a candidate key of this relation?	**04**
	(c)	Explain Inference Rules for Functional Dependency.	**07**
Q.4	**(a)**	What is the use of system log? What are the typical kinds of records in a system log? What are transaction commit points, and why are they important?	**03**
	(b)	Explain SQL Injection in brief.	**04**
	(c)	Explain Query Optimization with example.	**07**
		OR	
Q.4	**(a)**	Explain the use of Btrees.	**03**
	(b)	Explain Cursor in PL/SQL with example.	**04**
	(c)	Explain Conflict Serializability with precedence graph in Transaction Processing.	**07**
Q.5	**(a)**	Draw a state diagram, and discuss the typical states that a transaction goes through during execution.	**03**

(b) Explain Two phase locking protocol for guaranteeing Serializability. **04**

(c) Explain Deadlock handling in Transaction Processing. **07**

OR

Q.5 **(a)** Explain the use of group by and having clause in SQL queries. **03**

(b) Explain Triggers in PL/SQL with example. **04**

(c) Consider Following 3 Tables and Write SQL Queries. **07**

1. Books (BookID, BookTitle, Price, Author, Publisher)
2. Students (StudID, StudName, DOB, Gender, Branch, Sem)
3. Issue_Books (StudID, BookID, Issue_Date)

Query1: List all Books whose price in range of 300 to 500 Rs.
Query2: Display all Publisher Name & Total count of Books of that publisher.
Query3: Display list of all books which are not issued to any students.
Query4. Display the name students who are issued books in current month.
Query5: Display all Books assigned to student with name “mahesh”.
Query6: Display total no of books in library
Query7: Display the list of girl students who have taken book from library.

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