Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–III (NEW) EXAMINATION – WINTER 2024

Subject Code: 3130703 Date: 29-11-2024

Subject Name: 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. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define following terms. i) Database Management System ii) Instance iii) Logical Data independence	**03**
	(b)	List and explain categories of database users. Describe roles and responsibilities of database administrator.	**04**
	(c)	Compare the advantages of using a Database Management System (DBMS) over a file processing system.	**07**
Q.2	**(a)**	Explain generalization and specialization with neat diagram	**03**
	(b)	Explain following attributes. a. Single Valued b. Multivalued c. Derived attribute d. Composite attribute	**04**
	(c)	Draw an E-R diagram of following scenario. Make necessary assumptions and clearly note down the assumptions. Municipal Corporation/any Bus reservation system should be digitize.	**07**
		OR	
	(c)	Explain the concepts of strong entity and weak entity using real world example.	**07**
Q.3	**(a)**	Explain the terms. i) Super Key ii) Foreign Key iii) Unique Key	**03**
	(b)	Explain trivial functional dependencies with suitable example.	**04**
	(c)	Consider a relation R(A, B, C, D, E) with the following three functional dependencies. AB → C ; BC → D ; C → E; Find out the number of superkeys in the relation R.	**07**
		OR	
Q.3	**(a)**	Explain insertion and deleting anomalies with respect to normalization.	**03**
	(b)	Explain Armstrong's axioms in detail.	**04**
	(c)	Given a relation R(P, Q, R, S, T) and Functional Dependency set FD = { PQ → R, S → T }, determine whether the given R is in 2NF? If not convert it into 2 NF.	**07**

Q.4	**(a)**	Illustrate various storage strategies.	**03**
	(b)	Explain authorization and authentication with respect to database security.	**04**
	(c)	Which kind of queries are solved using division operator? Explain in detail.	**07**

OR

Q.4	**(a)**	Differentiate dynamic hashing and static hashing	**03**
	(b)	Explain ACID properties of transaction.	**04**
	(c)	Describe query processing with neat diagram.	**07**

Q.5	**(a)**	Explain working of two phase locking protocol.	**03**
	(b)	Explain GRANT, REVOKE and SAVEPOINT commands with suitable example.	**04**
	(c)	Assume table CUSTOMER (Cust_Id,Customer_name, Age,Address,Salary). Write a PL/SQL function which givens total number of customers having salary more than one lac per month.	**07**

OR

Q.5	**(a)**	Differentiate between conflict and view serializability with respect to transaction.	**03**
	(b)	Categorize joins in the SQL. Explain each with suitable example.	**04**
	(c)	Write a PL/SQL trigger where employee of "GTU Private Ltd." company cannot update database on 23-Dec-2024 due to maintenance.	**07**

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