Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA – SEMESTER-III   EXAMINATION –SUMMER-2020
Subject Code:4639303   **Date:06-11-2020**
Subject Name:Database Management Systems (DBMS)
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.

Q.1	**(a)**	Explain following terms. (1) Derived attribute (2) Cascading rollback (3) Role of DBA (4) Domain (5) De-normalization (6) Natural join (7) Data model	**07**
	(b)	Differentiate following with suitable examples: (1) Composite key, Candidate key, Alternate key (2) Physical data independence and Logical data independence	**07**
Q.2	**(a)**	Draw an ER diagram that captures following information and map it to relational model: A company database needs to store information about employees (identified by eno, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments; each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company.	**07**
	(b)	Explain each component modules of a DBMS and their interactions.	**07**
		OR	
	(b)	Discuss the concept of Generalization and Specialization with suitable example.	**07**
Q.3	**(a)**	Explain Union and Cartesian Product for relational algebra operations with example.	**07**
	(b)	What is functional dependency? How functional dependency works as crucial role in database design? Explain with example.	**07**
		OR	
Q.3	**(a)**	What is Normalization? Compare 3NF and BCNF with suitable example.	**07**
	(b)	Discuss Rename operator and aggregation functions in terms of Relational Algebra concept with examples.	**07**
Q.4	**(a)**	List and explain in brief the ACID properties of transaction with example.	**07**
	(b)	Discuss the features of good relational design.	**07**
		OR	
Q.4	**(a)**	What is schedule? Give examples of serial and concurrent schedule. Discuss seralizability concept in brief.	**07**

	(b)	Explain Multi-valued Dependency and Fourth Normal Form.	**07**
Q.5	**(a)**	Explain Immediate database update and Deferred Database update techniques of log based recovery systems.	**07**
	(b)	Explain Two phase locking with its advantages and disadvantages.	**07**

OR

| **Q.5** | **(a)** | Explain Validation-based concurrency control technique. What is optimistic concurrency control technique? | **07** |
| | **(b)** | What is the system log used for? What are the typical kinds of entries in a system log? What is checkpoint and why are they important? | **07** |

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