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| **SESSION** | **APRIL 2025** |
| **PROGRAM** | **MASTER OF COMPUTER APPLICATIONS (MCA)** |
| **SEMESTER** | **1** |
| **COURSE CODE & NAME** | **DCA6111 RELATIONAL DATABASE MANAGEMENT SYSTEM** |
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**Set – I**

**1. What is fourth normal form and fifth normal form? Explain with an example. 5+5**

**Ans 1.**

**Fourth Normal Form (4NF) and Fifth Normal Form (5NF)**

**Fourth Normal Form (4NF)**

The Fourth Normal Form (4NF) is an advanced level of database normalization that deals with multi-valued dependencies. A table is in 4NF if it is in Boyce-Codd Normal Form (BCNF) and has no multi-valued dependencies. A multi-valued dependency occurs when one attribute in a table determines multiple independent values of another attribute. This kind of dependency can lead to redundancy and data anomalies if not handled properly.

For example, consider a relation CourseInstructor with attributes: StudentID, Course, and Instructor. If a student can take multiple courses and be assigned multiple instructors

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**2. What do you mean by Keys in DBMS? What are the different keys in DBMS? Explain by giving example. 5+5**

**Ans 2.**

**Keys in DBMS and Their Types with Examples**

**Concept of Keys in DBMS**

In a Database Management System (DBMS), a key is a set of one or more attributes that uniquely identify a record in a table. Keys are crucial for maintaining data integrity, enforcing entity relationships, and enabling efficient retrieval of records. They ensure that no two rows in a table are identical in terms of key values. Without keys, relational databases would not be able to properly enforce uniqueness, ensure referential integrity, or optimize indexing and

**3. Explain the various types of databases anomalies. Explain by giving suitable example.**

**Ans 3.**

**Types of Database Anomalies with Examples**

**Introduction to Database Anomalies**

Database anomalies are problems that arise when a database is poorly designed, often due to redundancy and improper normalization. These anomalies compromise data integrity, lead to inconsistent information, and create inefficiencies in storing and managing data. The three most common types of database anomalies are insertion anomalies, update anomalies, and deletion anomalies. These usually occur in databases that are not normalized, particularly those in First

Set – II

**4. What are the three machine architectures upon which parallel DBMS run?(unit10)**

**Ans 4.**

**Machine Architectures for Parallel DBMS**

**Parallel DBMS Architectures**

Parallel Database Management Systems (Parallel DBMS) are designed to improve the performance of database operations by distributing workloads across multiple processors or machines. This allows for faster query processing, better throughput, and enhanced scalability. Parallel DBMS can run on different machine architectures based on how the hardware components are organized. The three primary architectures are Shared Memory, Shared Disk, and Shared Nothing. Each architecture has its own structure, benefits, and limitations

**5. a. What are the three basic components of select statement? Explain with an example.**

**b. Explain various transaction operations. 5+5**

**Ans 5**

**a. Basic Components of SELECT Statement in SQL**

**Components of a SELECT Statement**

The SELECT statement is one of the most fundamental commands in SQL, used to retrieve data from a database. It has three basic components: **SELECT**, **FROM**, and **WHERE**.

The SELECT clause specifies the columns to be retrieved. It can be used to select all columns using \* or to fetch specific columns. The FROM clause indicates the table from which the data

**6. What do you mean by Fragmentation? What are the different types of fragmentation. Explain by giving suitable example. 2+6+2**

**Ans 6.**

**Fragmentation and Its Types with Example**

**Definition of Fragmentation**

Fragmentation in a distributed database system refers to the process of breaking a large database into smaller, manageable pieces called fragments. These fragments are stored at different locations or sites in a network to improve performance, availability, and manageability. The main objective of fragmentation is to ensure that data is stored close to where it is most frequently accessed, thereby reducing data retrieval time and improving system