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| **SESSION** | **SEP 2024** |
| **PROGRAM** | **MASTER OF COMPUTER APPLICATIONS (MCA)** |
| **SEMESTER** | **1** |
| **COURSE CODE & NAME** | **DCA6111 RELATIONAL DATABASE MANAGEMENT SYSTEM** |
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**Set – I**

**1. What do you mean by data Model? Explain different types of data model by giving suitable example.**

**Ans 1.**

**Data Model and Its Types**

A **data model** is a conceptual representation of the data structures and relationships within a database. It provides a framework for organizing and defining the data to ensure consistency, reliability, and usability. Data models are essential for designing databases as they define how data is stored, accessed, and manipulated in a database system.

**Definition of a Data Model**

A data model defines the logical structure of the database, including the relationships and constraints that govern the data. It acts as a blueprint for building a database and helps bridge

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**2. Explain various transaction operations in DBMS. 10**

**Ans 2.**

**Transaction Operations in DBMS**

In a Database Management System (DBMS), a **transaction** is a sequence of operations performed as a single logical unit of work. Transactions are fundamental to ensuring data consistency and reliability in databases.

**Definition of a Transaction**

A transaction is a group of one or more operations that access or modify the database. It must satisfy the ACID (Atomicity, Consistency, Isolation, Durability) properties to ensure data

**3. Explain the various types of databases anomalies. Explain by giving suitable example. 10**

**Briefly describe SQL3 and its important features. 5+5**

**Ans 3.**

**Database Anomalies**

Database anomalies refer to problems that arise in a poorly designed database, particularly when inserting, updating, or deleting data. These issues often occur due to redundant data and lack of proper normalization, leading to inconsistencies and inefficiencies in database operations. The three main types of database anomalies are **Insertion Anomaly**, **Update Anomaly**, and **Deletion Anomaly**.

**Insertion Anomaly**

An insertion anomaly occurs when the database design prevents the addition of new data

**Set – II**

**4. What do you mean by Temporal database? What are its different types? Explain.**

**Ans 4.**

**Temporal Database and SQL3**

A **temporal database** is a database that manages time-related data. Unlike traditional databases, which store only the current state of the data, temporal databases store historical, current, and sometimes future states of data. These databases are particularly useful in applications where tracking changes over time is essential, such as financial systems, insurance records, and inventory tracking.

**Definition of Temporal Database**

A temporal database includes built-in support for handling time-related attributes. This

to the records, demonstrating the utility of temporal databases and SQL3's advanced features.

**5. What are the different lock modes used in the locking system? Discuss.**

**Ans 5.**

**Lock Modes in the Locking System**

A **locking system** in a database management system (DBMS) is a mechanism to ensure the consistency and integrity of data during concurrent transactions. Locks are used to control access to data items, preventing conflicts when multiple users attempt to read or modify the same data simultaneously. The DBMS uses various lock modes to manage these access controls.

**Definition of Lock Modes**

Lock modes determine the level of access a transaction has to a data item and how it interacts

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

**Ans 6.**

**Fragmentation in Databases**

**Fragmentation** in databases refers to the process of dividing a database into smaller, manageable pieces called fragments. This division helps improve database performance, especially in distributed database systems, by ensuring data is stored closer to where it is needed, reducing access times and improving query efficiency.

**Definition of Fragmentation**

Fragmentation involves breaking down database tables into subsets based on certain criteria. Each fragment is treated as an independent table but is logically linked to the others to