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| **SESSION** | **MARCH 2024** |
| **PROGRAM** | **BACHELOR OFCOMPUTER APPLICATIONS (BCA)** |
| **SEMESTER** | **III** |
| **COURSE CODE & NAME** | **DCA2102 – DATABASE MANAGEMENT SYSTEM** |
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**Set-I**

**1. A. Explain the Advantages and Disadvantages of the DBMS.**

**B. Differentiate between physical data independence and logical data independence**

**Ans 1.**

**Advantages and Disadvantages of DBMS:**

A database management system (DBMS) offers several advantages, but it also has its drawbacks.

Advantages:

1. Data Sharing: DBMS allows multiple users and applications to access the same data simultaneously, enabling data sharing and collaboration.
2. Data Security: DBMS provides mechanisms to enforce data security and integrity constraints, protecting data from unauthorized access and ensuring its accuracy.
3. Data Consistency: DBMS ensures that data remains consistent across the database,

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**2. Explain the concept of transactions in a database management system (DBMS). Discuss the properties of transactions and their importance in ensuring data consistency and integrity. Provide examples to illustrate each property.**

**Ans 2.**

**Concept of Transactions in a Database Management System (DBMS):**

In a database management system (DBMS), a transaction is a unit of work performed against a database that follows the ACID properties (Atomicity, Consistency, Isolation, Durability). Transactions ensure data integrity and consistency by allowing multiple operations to be treated as a single logical unit. If all operations within a transaction are completed successfully, the transaction is committed, making the changes permanent in the database. If any operation fails,

**3. Explain the concept of a foreign key in the context of relational databases. Discuss its role in maintaining referential integrity and preventing data inconsistencies. Provide examples to illustrate its usage.**

**Concept of Foreign Key in Relational Databases:**

In the context of relational databases, a foreign key is a column or a set of columns in a table that references the primary key or a unique key in another table. It establishes a relationship between two tables by enforcing referential integrity, which ensures that the values in the foreign key column(s) of one table correspond to the values in the primary key or unique key column(s) of another table.

**Set-II**

**4. Explain the concept of functional dependencies in the context of normalization. How do functional dependencies influence the normalization process? Provide examples. 10**

**Ans 4.**

**Concept of Functional Dependencies in Normalization:**

Functional dependencies (FDs) are a fundamental concept in the theory of database normalization. They describe the relationship between attributes in a relation (table) by specifying how the values of one set of attributes determine the values of another set of attributes. In simpler terms, a functional dependency describes a relationship where knowing the

**5. What are the fundamentals of relational algebra and its role in database management systems (DBMS). Discuss the basic operations of relational algebra and their significance in query processing and data manipulation. Provide examples to illustrate each operation.**

**Ans 5.**

**Fundamentals of Relational Algebra:**

Relational algebra is a mathematical query language used to manipulate relational databases. It provides a set of operations that can be performed on relations (tables) to retrieve, filter, and combine data. Relational algebra forms the basis for the query language SQL (Structured Query Language) used in relational database management systems (DBMS).

**Role in Database Management Systems (DBMS):**

Relational algebra plays a critical role in DBMS by providing a formal foundation for query

**6. Explain the concept of object-oriented database management systems (OODBMS). Discuss how OODBMS differs from traditional relational database management systems (RDBMS). Illustrate the advantages and disadvantages of using OODBMS over RDBMS with examples.**

**Ans 6.**

**Concept of Object-Oriented Database Management Systems (OODBMS):**

Object-oriented database management systems (OODBMS) are database management systems that support the modeling and creation of data as objects. In an OODBMS, data is represented as objects, similar to how objects are represented in object-oriented programming languages like Java or C++. These objects can encapsulate both data (attributes) and behavior (methods),

as the database grows in complexity.