PAPER ID-411155

**Roll No:** ☐☐☐☐☐☐☐☐☐☐☐☐☐

# BTECH
## (SEM IV) THEORY EXAMINATION 2023-24
## BASICS OF DATABASE MANAGEMENT SYSTEMS

**TIME: 3 HRS**                                                      **M.MARKS: 70**

**Note:** **1.** Attempt all Sections. If require any missing data; then choose suitably.

## SECTION A

**1.**     **Attempt *all* questions in brief.**                         **2 x 7 = 14**

| | |
|---|---|
| a. | Differentiate between logical and physical data independence? |
| b. | Give an example of a schema in a relational database? |
| c. | Define primary key? |
| d. | What does the SELECT statement do in SQL? |
| e. | Name one characteristic of SQL as a language? |
| f. | Name one inference rule used to derive FDs? |
| g. | Name one property of ACID? |

## SECTION B

**2.**     **Attempt any *three* of the following:**                  **7 x 3 = 21**

| | |
|---|---|
| a. | Provide examples of mapping constraints and explain their impact on database design? |
| b. | Provide an example and describe how SELECT filters rows from a relation? |
| c. | How does the ORDER BY clause work in SQL? Provide an example? |
| d. | Explain the conditions for a relation to satisfy 5NF and provide examples? |
| e. | Describe the concept of Time Stamping and how it is used to manage concurrent transactions? |

## SECTION C

**3.**     **Attempt any *one* part of the following:**                  **7 x 1 = 7**

| | |
|---|---|
| (a) | Outline the major modules in a database management system (DBMS) and their functions? |
| (b) | Explain the rules and conventions for creating ER diagrams, including proper use of symbols and notation? |

**4.**     **Attempt any *one* part of the following:**                  **7 x 1 = 7**

| | |
|---|---|
| (a) | Explain the basic concept and structure of the Relational Data Model? |
| (b) | Compare and contrast Relational Algebra with SQL in terms of query capabilities and syntax? |

**5.**     **Attempt any *one* part of the following:**                  **7 x 1 = 7**

| | |
|---|---|
| (a) | Discuss the importance of choosing appropriate data types in database design? |
| (b) | Explain the syntax and usage of CREATE, SELECT, INSERT, DELETE, and UPDATE statements in SQL? |

**6.**     **Attempt any *one* part of the following:**                  **7 x 1 = 7**

| | |
|---|---|
| (a) | Define multi-valued dependencies and explain their role in database design? |
| (b) | Explain the concept of normalization and its importance in relational database design? |

**7.**     **Attempt any *one* part of the following:**                  **7 x 1 = 7**

| | |
|---|---|
| (a) | Define Conflict Serializability and View Serializability and explain their differences? |
| (b) | Explain how transaction scheduling affects the execution of transactions in a database system? |