Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VII SEMESTER B. TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

END SEMESTER EXAMINATIONS, DECEMBER 2022

DATABASE MANAGEMENT SYSTEMS [ELE 4079]

REVISED CREDIT SYSTEM

Time: 3 Hours **Date: 29 DEC 2022** **Max. Marks: 50**

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. Explain the "**Levels of Abstraction**" in Database Management Systems. ***(03)***

1B. Explain **1-tier architecture** of DBMS. How is it useful during the development stage of a software application? ***(03)***

1C. With suitable example(s), illustrate, how **PRIMARY** keys are assigned to entities and relationship sets. ***(04)***

2A. Create **Entity-Relationship (ER)** models for the following cases:

a. Student is enrolled in a course.
b. A person is a citizen of a country.
c. A faculty works in a teaching department. ***(03)***

2B. Show the **Relational Schema** (model) for the following cases:

a. Student is enrolled in a course.
b. A person is a citizen of a country.
c. A faculty works in a teaching department. ***(03)***

2C. With the help of suitable example(s), demonstrate **Specialization** and **Generalization** in Entity-Relationship (ER) models. ***(04)***

3A. Statement: **Student is enrolled in a course**.

Consider the statement given above, write **relational algebra** expressions for the following:

1. List the names of the students enrolled in a course titled "DBMS".
2. List the titles of all courses.
3. Count the number of students enrolled in a course titled "DBMS". ***(03)***

3B. With the help of suitable examples, demonstrate the concept of **Database normalization.** ***(03)***

3C. What are the requirements of the **First Normal Form** (1NF) of relational database design? Illustrate **1NF** with the help of a suitable example. ***(04)***

4A. Statement: **Student is enrolled in a course**.

Consider the statement given above, write SQL statements to create tables for entities and relationship sets in a relational database (MySQL). ***(03)***

4B. Statement: **Student is enrolled in a course**.

Consider the statement given above, write SQL statements for the following cases:

1. List the names of the students enrolled in a course titled "DBMS".
2. List the titles of all courses.
3. Count the number of students enrolled in a course titled "DBMS".

(03)

4C. With the help of neat sketch illustrate **"Deadlock"** in DBMS. Explain how deadlocks can be prevented in DBMS.

(04)

5A. What is the purpose of **RAID** in DBMS? Explain how **RAID** works.

(03)

5B. For a student project it is required to measure temperature on an hourly basis and store it in a MYSQL database.

If only MATLAB and MYSQL database were available for the student, is it possible for the student to save the temperature measurements using MATLAB into MYSQL database, explain. ***(03)***

5C. For a student project it is required to measure temperature on an hourly basis and store it in a MYSQL database.

For the above requirement do the following:

1. Create relational schema(s) to store temperature details on an hourly basis.
2. In the relational schema created, identify the attributes that can be used as **PRIMARY** and **FOREIGN** keys. ***(04)***