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Roll No. -----

MCS-505/MIT (CS)-402

**Database Management System/ Introduction
to DBMS**

(MCA/MSCT/MSCCS)

2nd / 4th Semester Examination 2024(Dec.)

Time: 2:00 hrs

Max. Marks: 70

Note : This paper is of Seventy (70) marks divided into Two (02) Section A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

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Section-A (Long-Answer-Type Questions)

Note : Section 'A' contains Five (05) long-answer-type questions of Nineteen (19) marks each. Learners are required to answer any Two (02) questions only.

[2x19=38]

- Q.1. Discuss the various components of a DBMS and their roles in managing data effectively. Explain the different types of database architecture with diagrams and examples, including centralized, distributed, and client-server models.
- Q.2. Discuss the various types of data models used in database systems. Explain the hierarchical, network, and relational models in detail, highlighting their differences, advantages, and limitations. Provide examples of real-world applications where each model would be best suited.
- Q.3. What is normalization in database design? Discuss its objectives and the need for normalization in a relational database system. How does normalization help in reducing redundancy, improving data integrity, and optimizing storage?

- Q.4. Discuss the basic data types available in SQL, such as INTEGER, VARCHAR, DATE, and FLOAT etc.. Provide examples of each data type and explain when they should be used. In addition, describe some common SQL commands and their functions in manipulating data in a relational database.
- Q.5. Explain the CODD's Rule in the context of relational database management systems. How do they contribute to the design and management of relational databases?

Section-B (Short-Answer-Type Questions)

Note : Section 'B' contains Eight (08) short-answer-type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only.

[4x8=32]

- Q.1. Explain the concepts of Cardinality and Degree in the relational data model. Discuss how they are used to describe a relation's size and structure.

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- Q.2. Discuss database security. Explain the steps involved in creating a secure database system.
- Q.3. What is the importance of database backup in an organization.
- Q.4. What are integrity constraints? Discuss entity and referential integrity constraints.
- Q.5. What are the different types of database users?
- Q.6. A hospital database stores information about patients, doctors, and appointments. The requirements are as follows:
- a. Each patient has a unique Patient_ID, Name, and Address.
 - b. Each doctor has a unique Doctor_ID, Name, and Speciality.
 - c. Each appointment is associated with one doctor and one patient, and it is identified by

a unique Appointment_ID and
Appointment_Date.

- d. A doctor can attend multiple patients, but a patient can only have one appointment with a doctor on a given date.

Draw the ER diagram for this case study. Make assumption if necessary.

- Q.7. Compare some popular database backup tools. Highlight their unique features, strengths, and limitations.
- Q.8. Discuss and differentiate between centralized DBMS, parallel DBMS and distributed DBMS.
