A–1104

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MSCIT–14/MCA–13

MSCIT/MCA

(Advanced Database Management System)

4th Semester Examination, 2024 (June)

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) Sections '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.

Section–A

(Long Answer Type Questions) 2×19=38

***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.

1. Define a data model and describe its role in representing the structure, relationships, and constraints of data. Explain the importance of data models in database design and implementation.

2. Describe the essential features of a DBMS, such as data independence, efficient data access, data integrity and security, data administration, and concurrent access.

3. Explain the concept of normalization and its primary goals, such as eliminating redundancy and ensuring data integrity. Discuss why normalization is crucial for efficient and reliable database design.

4. Explain the concept of transaction processing and its significance in maintaining data , integrity and consistency in database systems. Discuss the role of transaction processing in supporting reliable and efficient database operations.

5. Explain any two techniques to control the concurrency in distributed database.

Section–B

(Short Answer Type Questions) 4×8=32

***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.

1. Identify and describe the different types of database users.

2. Explain generalization, specialization and aggregation in the context of database design ? Provide an example.

3. Briefly discuss about Codd's rule with suitable example.

4. Define functional dependencies and explain their role in the normalization process. Provide examples of functional dependencies and how they are used to identify and eliminate anomalies in database design.

5. Define the ACID properties and describe each one. Explain how these properties ensure the reliability and integrity of transactions.

6. Explain the role of recovery techniques in ensuring transaction durability. Describe common methods such as log-based recovery, check pointing, and shadow paging.

7. What is the role of encryption in database security ? How does it protect data ?

8. Create an ER Diagram for a Hospital where patients can consult to the doctors of various department. There is a pathology lab where patient can test and report is associated to the patient. Categorize the attributes using different symbols. Make assumption if necessary.

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