H.T No

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(An Autonomous Institution)

Regulations: A22

**Code No:9FC04** **Date: 12-August-2024 (FN)**

**B.Tech II-Year II- Semester External Examination, August-2024 (Regular)**

**DATA BASE MANAGEMENT SYSTEMS (CSE,IT,ECM,CS,AIML,DS,IOT)**

**Time: 3 Hours** **Max.Marks:60**

***Note:*** *a) No additional answer sheets will be provided.*
*b) All sub-parts of a question must be answered at one place only, otherwise it will not be valued.*
*c) Missing data can be assumed suitably.*

**Bloom's Cognitive Levels of Learning (BCLL)**

| | | | | | |
|---|---|---|---|---|---|
| Remember | L1 | Apply | L3 | Evaluate | L5 |
| Understand | L2 | Analyze | L4 | Create | L6 |

## Part - A Max.Marks: 6x2=12

**ANSWER ALL QUESTIONS, EACH QUESTION CARRIES 2 MARKS.**

| | | BCLL | CO(s) | Marks |
|---|---|---|---|---|
| 1 | What are the 3 levels of data abstraction in Database Systems? | L1 | CO1 | [2M] |
| 2 | Define selection and projection operations in relational algebra. | L2 | CO2 | [2M] |
| 3 | Write an SQL query to retrieve the first_name and last_name columns from a table named Employee. | L5 | CO3 | [2M] |
| 4 | What is a functional dependency (FD) in a database? | L1 | CO4 | [2M] |
| 5 | Define serializability in the context of transaction management. | L3 | CO5 | [2M] |
| 6 | Define file organization in databases and give an example. | L1 | CO6 | [2M] |

## Part – B Max.Marks: 6x8=48

**ANSWER ALL QUESTIONS. EACH QUESTION CARRIES 8 MARKS.**

| | | BCLL | CO(s) | Marks |
|---|---|---|---|---|
| 7. | Describe the overall structure of a database system. And Discuss the functions of storage manager and the query processor. | L4 | CO1 | [8M] |
| | OR | | | |
| 8 | Explain the roles of Data Definition Language (DDL) and Data Manipulation Language (DML) in database systems. Provide SQL examples for each. | L3 | CO1 | [8M] |
| 9. | **a)** Explain the significance of set operations (union, intersection, set difference) in relational algebra, with examples. | L2 | CO2 | [8M] |
| | **b)** Describe the purpose of views in a relational database. Provide an example of creating a view and explain how it can be used in queries. | | | |
| | OR | | | |
| 10 | **a)** Define Tuple relational calculus and Domain relational calculus. Provide examples to illustrate the differences between them. | L1 | CO2 | [8M] |
| | **b)** Describe Integrity Constraints in detail. | L3 | | |
| 11 | Explain the concept of nested queries in SQL and provide an example of how they can be used to retrieve data from multiple related tables effectively. | L3 | CO3 | [8M] |
| | OR | | | |
| 12 | Explain how SQL handles NULL values in comparisons and aggregations, and discuss strategies for managing NULL values effectively in database queries | L2 | CO3 | [8M] |
| 13 | What is Normalization, Explain Second Normal form and Third Normal form with an example? | L2 | CO4 | [8M] |
| | OR | | | |
| 14 | Determine the closer of the following set of functional dependencies for a relation scheme. R(A,B,C,D,E,F,G,H), F={ AB→C, BD→EF, AD→G, A→H} and List the candidate keys of R. | L5 | CO4 | [8M] |

| | | | | |
|---|---|---|---|---|
| 15 | Define the ACID properties of database transactions. Discuss why these properties are essential for ensuring reliable transaction processing. | L4 | CO5 | [8M] |
| | OR | | | |
| 16 | What are concurrent executions of transactions? How does serializability ensure consistent database state in a production environment? | L3 | CO5 | [8M] |
| 17 | Describe B+ tree architecture and its advantages in indexing large datasets, particularly for range queries. | L4 | CO6 | [8M] |
| | OR | | | |
| 18 | What is Indexing? Differentiate the types of Indexing techniques. | L3 | CO6 | [8M] |

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