**Subject Code:24CT11RC12** **R-24** **Reg No:** | | | | | | | | | | | | |

**GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN**
**(Autonomous)**
(Affiliated to Andhra University, Visakhapatnam)
**IIB.Tech. - II Semester Regular Examinations, April – 2026**
**DATABASE MANAGEMENT SYSTEMS**
[Commonto CSE & INF]

1. All questions carry equal marks
2. Must answer all parts of the question at one place

**Time: 3Hrs.** **Max Marks: 70**

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## UNIT-I

1. a. Explain the concept of a database system and its components. Compare a database system with a traditional file system, highlighting key differences in terms of data redundancy, consistency, and security. Illustrate with a suitable real-world example. **[7M]**

   b. How database users are classified according to their roles? Write at least 5 functions of database administrators. **[7M]**

OR

2. a. Explain the structure of a Database Management System (DBMS) and describe the functions of its components with a neat diagram. **[7M]**
   b. Explain the difference between external, internal, and conceptual schemas. How these different schema layers are related to the concepts of logical and physical data independence? **[7M]**

## UNIT-II

3. a. Design an E-R diagram for a College Management System that includes: Students, Courses, Faculty, and Enrollment. Clearly indicate keys, attributes, and relationships. **[7M]**
   b. Explain SQL data types and table creation commands (CREATE, ALTER) with syntax. **[7M]**

OR

4. a. Explain SQL functions: Date & Time, Numeric, and String functions with examples. **[7M]**
   b. Write SQL queries for the following: Employee (EID, Name, Salary, JoinDate) **[7M]**
      i. Find average salary
      ii. Display employee names in uppercase
      iii. Extract year from JoinDate
      iv. Concatenate name with salary

## UNIT-III

5. a. Explain the fundamental concepts of the Relational Model: domain, attribute, tuple, and relation with examples. **[7M]**
   b. Explain Key Constraints, Entity Integrity, and Referential Integrity with examples. **[7M]**

OR

6. a. Explain GROUP BY, HAVING, ORDER BY clauses with examples. **[7M]**
   b.Write a trigger for the following: Account(AcNo, Balance) **[7M]**
      i. Prevent withdrawal if balance < 1000
      ii. Automatically update balance after transaction

## UNIT-IV

7. a. Define Functional Dependency (FD) and explain types of dependencies with examples. **[7M]**
   b. Explain 1NF, 2NF, and 3NF with examples. **[7M]**

OR

8. a. Explain Boyce-Codd Normal Form (BCNF) and compare it with 3NF. **[7M]**
   b. Explain Lossless Join Decomposition and Dependency Preservation. **[7M]**

## UNIT-V

9. a. Define a Transaction and explain ACID properties with suitable examples. **[7M]**
   b. Explain deadlocks and their detection, prevention, and recovery methods. **[7M]**

OR

10. a. Explain Two-Phase Locking (2PL) protocol and its types. **[7M]**
    b. Explain data storage on external storage and file organization methods (heap, sequential, hashing). **[7M]**