R22 Regulation *Subject code:4O7AA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VII Semester Regular Examinations, November 2025

DATABASE MANAGEMENT SYSTEM

(CE)

Maximum Marks: 60 Date: 28.11.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	Define Database and DBMS	1M	1	L1
b)	List various database system applications.	1M	1	L1
c)	Identify the components of an ER diagram.	1M	2	L1
d)	Classify different types of attributes with examples.	1M	2	L2
e)	State the purpose of integrity constraints in RDBMS.	1M	3	L2
f)	Identify any two aggregate functions in SQL.	1M	3	L1
g)	Define Transaction and Atomicity.	1M	4	L1
h)	Summarize different types of database failures.	1M	4	L2
i)	Define indexing and its purpose.	1M	5	L1
j)	Identify the structure of a B+ tree.	1M	5	L2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) Illustrate the structure of DBMS. b) Summarize the roles of database users and administrators.	5M 5M	1	L2 L2
	OR			
3	a) Explain the database design and ER diagram. b) Demonstrate the process of data abstraction in database design.	5M 5M	1	L3 L3
4	a) Construct a relational schema for a college database using proper constraints. b) Apply relational algebra operations (SELECT, PROJECT, JOIN) to retrieve information.	5M 5M	2	L3 L3
	OR			
5	a) Analyze the role of integrity constraints in maintaining data consistency. b) Differentiate between relational algebra and relational calculus. (5M)	5M 5M	2	L3 L4

6	a) Develop SQL commands to create tables, insert data, and query information. b) Apply normalization techniques (up to 3NF) to reduce data redundancy.	5M 5M	3	L3 L3
	OR			
7	a) Construct SQL queries using aggregate functions and GROUP BY clause. b) Analyze a given schema to identify functional dependencies.	5M 5M	3	L3 L4
8	a) Summarize ACID properties with suitable examples. b) Apply concurrency control protocols to handle conflicting transactions.	5M 5M	4	L2 L3
	OR			
9	a) Compare timestamp-based and validation-based concurrency techniques. b) Outline the recovery process in case of system failure.	5M 5M	4	L4 L2
10	a) Demonstrate insertion and deletion operations in a B+ tree. b) Examine advantages of hash-based indexing compared to tree indexing.	5M 5M	5	L3 L4
	OR			
11	a) Construct an example to show extendible hashing operations. b) Evaluate indexing techniques in terms of access time and storage overhead.	5M 5M	5	L3 L4