R22 Regulation *Subject code: 4O7AA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Regular/Supplementary Examinations, October 2026

DATABASE MANAGEMENT SYSTEMS

(Civil Engineering)

Maximum Marks: 60 Date:30.10.2026 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	BTL
1.a)	Define data independence.	1M	1	L1
b)	What is a relationship set in an ER model?	1M	1	L1
c)	State the entity integrity constraint.	1M	2	L1
d)	Differentiate tuple relational calculus from domain relational calculus.	1M	2	L2
e)	What is the purpose of the HAVING clause in SQL?	1M	3	L1
f)	Define a functional dependency.	1M	3	L1
g)	What is a serializable schedule?	1M	4	L1
h)	List any two transaction isolation levels.	1M	4	L1
i)	What is the role of an index in a database?	1M	5	L1
j)	Distinguish static hashing from dynamic hashing.	1M	5	L2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	Design an ER model for a university database with suitable entities, keys, relationships and participation constraints.	10M	1	L2
	OR			
3	a) Compare file systems vs DBMS. b) Explain Generalization, specialization and aggregation in the ER model with suitable examples.	5M 5M	1	L2
4	a) Explain the basic operations of Relational Algebra with suitable examples. b) Discuss the different types of integrity constraints in the Relational Model.	5M 5M	2	L3
	OR			
5	Explain database views and discuss the operations used to create, alter, and destroy views.	10M	2	L3

6	Write SQL statements to create STUDENT, COURSE, and ENROLLMENT tables with suitable primary-key and foreign-key constraints.	10M	3	L3
	OR			
7	a) Explain triggers in SQL and discuss their role in active database systems. b) For R(A, B, C, D, E) with F = {A -> BC, C -> D, D -> E}, find the candidate key and normalize R up to 3NF. State whether the decomposition is lossless and dependency preserving.	5M 5M	3	L2 L3
8	a) Explain the ACID properties of transactions and the different states of a transaction. b) Explain conflict serializability using a precedence graph with a suitable example.	5M 5M	4	L2 L3
	OR			
9	Describe log-based recovery using Write-Ahead Logging (WAL), checkpoints, and undo/redo operations.	10M	4	L2 L2
10	Explain the structure of a B+ Tree and demonstrate the search operation with a suitable example.	10M	5	L3
	OR			
11	a) Explain static hashing and the methods used to handle collisions. b) Compare heap files, sorted files, and indexed file organizations.	5M 5M	5	L2 L2