R20 Regulation *Subject code: 3P3ED*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, December 2025

DATABASE MANAGEMENT SYSTEMS

(Common to CSE, CSE(AI&ML) & CSE(DS))

Maximum Marks: 70 Date: 22.12.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 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 (10X2M=20 Marks)		Marks	CO	BTL
1	Define weak and strong entity sets.	2M	1	L1
2	Define NULL values.	2M	1	L1
3	What are stored and derived attributes?	2M	2	L1
4	What is meant by normalization of data?	2M	2	L1
5	Write about relational model.	2M	3	L1
6	What is a candidate key?	2M	3	L1
7	List the properties of transaction.	2M	4	L1
8	Write about recoverable schedules.	2M	4	L1
9	What is clustered index?	2M	5	L1
10	What is the order of B+ tree?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a) Explain Database administrator's responsibilities. b) Explain differences between logical and physical independencies.	5M 5M	1	L2
	OR			
12	Explain additional features of ER Model.	10M	1	L2
13	Let the following relational schemas be given: R= (A, B, C) S= (D, E, F) Let the relations r(R) and s(S) be given. Give an expression in the tuple relational calculus that is equivalent to each of the following: i) ΠA(r) ii) σB=17(r) iii) rXs iv) ΠA,F(σC=D(rXs))	10M	2	L2
	OR			
14	Explain integrity constraints over relations with examples.	10M	2	L2

15	Consider the relational schema R = (ABCD) and the set of functional dependencies [10] F = {AB->C, B->D, C ->A} . a) Prove that R is not in BNCF. b) Suitably decompose R into appropriate relational schemas that are in BCNF. c) Is the obtained decomposition lossless? Is the obtained decomposition dependency preserving? d) If you were allowed to have relational schemas that are in 3NF, what would have been the decomposition (possibly containing schemas that are in 3NF but not in BCNF)?	10M	3	L2
	OR			
16	Explain 3NF, 4NF Normal forms.	10M	3	L2
17	Describe Timestamp based locking protocols.	10M	4	L2
	OR			
18	Explain Buffer Management.	10M	4	L2
19	Write in detail about index data structures?	10M	5	L2
	OR			
20	What is Extendible hashing? How does it handle search, insert and delete explain in detail.	10M	5	L2