

**THE KAVERY ENGINEERING COLLEGE***(An Autonomous Institution)***BE/ B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL/MAY 2026*****Fourth Semester*****CS3492 / UCST24401 – DATABASE MANAGEMENT SYSTEMS****(Common to BE-CSE / BTECH-AIDS / BTECH-IT)*****Regulations - 2021/2024******Duration : 3 Hrs******Maximum : 100 Marks******PART – A (ANSWER ALL QUESTIONS) (Marks 10\*2=20)***

| <i>Q.No</i> | <i>Questions</i>                                                          | <i>BTL</i> | <i>CO</i> | <i>Marks</i> |
|-------------|---------------------------------------------------------------------------|------------|-----------|--------------|
| 1.          | List types of data models.                                                | L1         | 1         | 2            |
| 2.          | What is embedded SQL?                                                     | L1         | 1         | 2            |
| 3.          | What is functional dependency.                                            | L1         | 2         | 2            |
| 4.          | Differentiate normalization vs denormalization trade-offs.                | L2         | 2         | 2            |
| 5.          | List the ACID properties.                                                 | L1         | 3         | 2            |
| 6.          | Outline the recovery techniques.                                          | L2         | 3         | 2            |
| 7.          | What is the main idea of join algorithms?                                 | L1         | 4         | 2            |
| 8.          | How would you classify the type of hashing techniques for record storage? | L1         | 4         | 2            |
| 9.          | Summarize the database security techniques and threats                    | L2         | 5         | 2            |
| 10.         | What is CAP theorem?                                                      | L1         | 5         | 2            |

***PART – B (ANSWER ALL QUESTIONS) (Marks 5\*16 = 80)***

| <i>Q.No</i> | <i>Questions</i>                                                             | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|------------------------------------------------------------------------------|------------|-----------|--------------|
| 11. a       | i Discuss a database schema for a real-world application using SQL.          | L2         | 1         | 8            |
|             | ii Describe relational algebra in detail.                                    | L2         | 1         | 8            |
|             | <b>Or</b>                                                                    |            |           |              |
| b           | Explain database system architecture and data models in detail.              | L2         | 1         | 16           |
| 12. a       | i Illustrate the ER diagram concepts with an example.                        | L2         | 2         | 8            |
|             | ii Summarize anomalies in unnormalized database.                             | L2         | 2         | 8            |
|             | <b>Or</b>                                                                    |            |           |              |
| b           | Explain a normalized database schema for a university system.                | L2         | 2         | 16           |
| 13. a       | i Apply Two Phase Locking in transaction control.                            | L3         | 3         | 8            |
|             | ii Make use of deadlock detection and prevention techniques in detail.       | L3         | 3         | 8            |
|             | <b>Or</b>                                                                    |            |           |              |
| b           | Construct a transaction management system ensuring consistency and recovery. | L3         | 3         | 16           |
| 14. a       | i Examine the efficient indexing strategy for large datasets.                | L4         | 4         | 8            |
|             | ii Classify the query optimization techniques.                               | L4         | 4         | 8            |

**Or**

|     |    |                                                                 |                                                                      |    |    |   |
|-----|----|-----------------------------------------------------------------|----------------------------------------------------------------------|----|----|---|
|     | b  | Analyze B-tree vs B+ tree indexing. (K4)                        | L4                                                                   | 4  | 16 |   |
| 15. | a  | i                                                               | Construct the NoSQL database types (key-value, document, and graph). | L5 | 5  | 8 |
|     |    | ii                                                              | Explain the distributed database architecture.                       | L5 | 5  | 8 |
|     | Or |                                                                 |                                                                      |    |    |   |
|     | b  | Explain a distributed database system with security mechanisms. | L5                                                                   | 5  | 16 |   |