

# CBCS SCHEME

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## Second Semester MCA Degree Examination, June/July 2023 Database Management System

Time: 3 hrs.

Max. Marks: 100

**Note:** Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Explain the Database System Environment with neat diagram. (10 Marks)
- b. Discuss the characteristics and advantages of Database Approaches. (10 Marks)

OR

- 2 a. Explain with proper diagram, the 3 – schema architecture of DBMS. (10 Marks)
- b. What are the different types of attributes? Explain with example. (10 Marks)

### Module-2

- 3 a. Explain Unary Operation SELECT ( $\sigma$ ) and prove it is commutative. (10 Marks)
- b. Explain Schema Update Operations, with a suitable examples. (10 Marks)

OR

- 4 a. With a suitable example, explain Join and division operation in relational algebra. (10 Marks)
- b. Explain in detail ER – to – Relational Mapping algorithm. (10 Marks)

### Module-3

- 5 a. Explain with suitable example the basic structure of SQL query. (10 Marks)
- b. What are Views in SQL? Explain. (10 Marks)

OR

- 6 a. In SQL how to handle the Aggregate functions with group by and having clauses? With examples. (06 Marks)
- b. What are Aggregate functions? Explain with an examples. (06 Marks)
- c. Explain the architecture of JDBC main components and types of drivers. (08 Marks)

### Module-4

- 7 a. Discuss informal design guidelines for relational schema. (10 Marks)
- b. What is Normalization? What are its advantages? Discuss 1NF, 2NF and 3NF. (10 Marks)

OR

- 8 a. Explain with an example the Boyce – Codd Normal Form (BCNF). (10 Marks)
- b. Discuss the different inference rules for functional dependencies. (10 Marks)

### Module-5

- 9 a. Explain ACID properties of transaction in details. (10 Marks)
- b. Discuss the characterizing schedules based on recoverability. (10 Marks)

OR

- 10 a. Discuss a Lock – based concurrency control issue in DBMS transaction processing. (10 Marks)
- b. Describe Granularity of data items and Multiple Granularity locking. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.