

Roll No: \_\_\_\_\_

Date: \_\_\_/\_\_\_/\_\_\_

# St. Claret College

Autonomous, Bengaluru

UG END SEMESTER EXAMINATION-NOVEMBER 2025

BCA - III SEMESTER

CA 3125: DATABASE MANAGEMENT SYSTEM

8



TIME: 3 hours.

MAX. MARKS: 80

This paper contains TWO printed pages and FOUR parts

**Instructions:**

1. Verify and ensure that the question paper is completely printed.
2. Any discrepancies or questions about the exam paper must be reported to the COE within 1 hour after the examination.
3. Students must check the course title and course code before answering the questions.

**PART-A**

Answer ALL questions. Each answer carries ONE mark.

[ 10 x 1 = 10 ]

1. Which of these is NOT a type of data model?  
a) Relational    b) Object-oriented    c) Network    d) Distributed
2. In the relational model, data is represented as:  
a) Graphs    b) Trees    c) Tables    d) Objects
3. Which key constraint allows linking of tables?  
a) Candidate Key    b) Primary Key    c) Foreign Key    d) Composite Key
4. Relational Algebra is a:  
a) Procedural query language    b) Non-procedural query language  
c) High-level language    d) Programming language
5. The selection operation in Relational Algebra is denoted by:  
a)  $\pi$     b)  $\sigma$     c)  $\times$     d)  $\cup$
6. Which SQL command removes only data but not the table structure?  
a) DROP    b) REMOVE    c) TRUNCATE    d) ALTER
7. In a binary lock, a data item can be:  
a) Read only    b) Write only    c) Locked or Unlocked    d) Shared or Exclusive
8. B+ Tree differs from B-tree by:  
a) Having only leaf nodes store data pointers    b) Being binary only  
c) Not supporting range queries    d) Using hashing
9. NoSQL databases are often described as:  
a) One size fits all    b) Not only SQL  
c) Non-standard query language    d) No storage query language

10. CAP theorem stands for:

- a) Consistency, Availability, Partition tolerance
- b) Correctness, Accuracy, Partitioning
- c) Commit, Atomicity, Partition
- d) Cache, Availability, Performance

### PART-B

**Answer any FIVE questions. Each answer carries TWO marks.**

**[ 5 x 2= 10]**

- 11. What is DBMS?
- 12. List the different types of data models used in DBMS.
- 13. Describe any two Aggregate functions with examples.
- 14. What are Armstrong's Axioms?
- 15. What is the 2PL protocol in DBMS?
- 16. Define NoSQL.
- 17. What is Big Data?

### PART-C

**Answer any FOUR questions. Each answer carries FIVE marks.**

**[ 4 x 5 = 20]**

- 18. Explain different types of keys with examples.
- 19. Explain any five types of Join Operations.
- 20. Differentiate embedded SQL and dynamic SQL.
- 21. Explain the ACID properties of transactions.
- 22. Explain Serializability and Recoverability.
- 23. Differentiate NoSQL and SQL.

### PART-D

**Answer any FOUR questions. Each answer carries TEN marks.**

**[4 x 10 =40]**

- 24. a) Describe the various notations and symbols used in an Entity–Relationship (ER) diagram. [5]  
b) Discuss the major advantages and disadvantages of a Database Management System. [5]
- 25. Explain the different types and steps of Normalization used in DBMS with suitable examples.
- 26. a) Describe in detail the various DDL commands in SQL with examples. [5]  
b) Explain the concept concurrency control in DBMS. [5]
- 27. Discuss in detail the different file organization methods and indexing techniques used in database systems.
- 28. a) Explain the concept of locking in DBMS. [5]  
b) Discuss CRUD operations in NoSQL databases with examples [5]
- 29. Describe the types NoSQL databases with suitable examples.