

**MASTER OF COMPUTER
APPLICATIONS (MCA) (REVISED)
Term-End Examination
June, 2026**

**MCS-043 : ADVANCED DATABASE
MANAGEMENT SYSTEM**

Time : 3 Hours

Maximum Marks : 100

Note : *Question No. 1 is compulsory. Answer any **three** questions from the rest.*

1. (a) Describe the steps involved in converting an EER-diagram to relational table. 5
- (b) Explain the concept of multivalued dependency with an example. 5
- (c) How are Views and Embedded SQL useful in application development ? 5

- (d) What is the significance of the system catalog in query processing ? 5
 - (e) Differentiate between logical and physical data independence with the help of an example. 7
 - (f) Explain the steps of distributed 2 phase commit protocol. Why is it important ? 8
 - (g) What is statistical database security ? Explain with the help of an example. 5
2. (a) Describe the architecture and use of Oracle database in enterprise environment. 8
- (b) Describe the transaction recovery mechanism in DBMS. Explain how check points and logs are used to ensure atomicity and durability. 7
- (c) Write the steps of a database trigger for inserting new employee record while checking salary limits between 20,000 and 50,000. 5

3. (a) What are the components and phases of a query evaluation plan ? Illustrate with a suitable example and explain how the plan is optimized. 10
- (b) Discuss distributed concurrency control techniques. How does the system avoid and resolve conflicts in distributed DBMS ? 7
- (c) List the major differences between SQLJ and JDBC. 3
4. (a) Explain the working and components of a data Grid in DBMS. How does it support large scale data processing. 7
- (b) What are the main challenges in handling Gnome and Spatial Database ? Provide real world use cases. 5
- (c) What is the purpose of audit trails in database security ? How are they implemented ? 4
- (d) Write a note on the role of cost estimation in query processing. 4

5. Write short notes on any *four* of the following : 4×5=20

- (a) Assertions in SQL
- (b) Lock-based concurrency control
- (c) Multimedia database
- (d) Role of ODBC in web database
- (e) Use of replication in postgre SQL

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