| Roll No. | | | | | | | |
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**25-CS-24**

# M.Sc. II SEMESTER [MAIN/ATKT] EXAMINATION MAY - JUNE 2025

## COMPUTER SCIENCE

Paper - IV

**[Database Management System]**

*[Max. Marks : 75]* *[Time : 3:00 Hrs.]* *[Min. Marks : 26]*

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**Note :** Candidate should write his/her Roll Number at the prescribed space on the question paper.
Student should not write anything on question paper.
Attempt all five questions. Each question carries an internal choice.
Each question carries **15 marks.**

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**Q. 1 a)** Describe the differences between strong entity and weak entity with suitable examples.

**b)** Explain the role and responsibilities of a Database Administrator in detail.

**OR**

**a)** What is the Data Model ? Discuss its key features and benefits.

**b)** Explain different types of Relationships in a ER Model.

**Q. 2** Give the following relations -

Student (Rollno, Name, Age, Course)

Result (Rollno, Marks)

Write relational algebra expression for -

i) Retrieve the names of students who have scored more than 75 Marks.

ii) List the names and courses of students who have not received any marks (i.e.) not present in the result table).

iii) List the names of students enrolled in M.Sc. course and have scored more than 70 Marks).

**OR**

**a)** Explain referential integrity constraint with example.

**b)** What is Data Manipulation Language (DML) ? List the various DML commands.

P.T.O.

**Q. 3 a)** What is Normalization in DBMS ? Why is it important.

**b)** Differentiate between Multivalue dependency and transitive dependency.

**OR**

**a)** Define partial dependency and its impact on a database in 2NF.

**b)** What is Decomposition ? Discuss lossless and dependency preserving decomposition with suitable example.

**Q. 4 a)** Discuss lock based protocol.

**b)** What is Timestamp based protocol in DBMS

**OR**

**a)** What are the necessary condition for a deadlock to occurs in DBMS ?

**b)** Define concurrency control in DBMS ? Why is it important in DBMS.

**Q. 5 a)** What is Crash Recovery in DBMS ? Why is it essential for database system.

**b)** Explain failure classification in DBMS.

**OR**

**a)** What are the advantages of log based recovery.

**b)** What is Atomicity in DBMS ? Explain with an example.