

Roll No.

Total Pages : 3

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May-2026

B.Sc. (MATHS/MATHS & COMP.) II SEMESTER

Fundamentals of Database System

(OEC-CE-1013)

Time : 3 Hours]

[Maximum Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any **four** questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) What is the difference between DBMS and traditional file system? (1.5)
- (b) What are front-end tools? (1.5)
- (c) What is an attribute? Explain with the help of an example. (1.5)
- (d) Differentiate between primary key and candidate key. (1.5)
- (e) Differentiate between strong entity and weak entity. (1.5)

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- (f) Explain with the help of a suitable example, what is an entity set? (1.5)
- (g) What is the need for normalization in database design? (1.5)
- (h) Define relation, with an example. (1.5)
- (i) Explain the importance of ER modelling in database design. (1.5)
- (j) Explain different types of database users with examples. (1.5)

PART-B

- 2. (a) Discuss the role and responsibilities of a Database Administrator (DBA). (8)
- (b) What is data independence? Explain logical and physical data independence. (7)
- 3. (a) Discuss mapping cardinalities (1:1, 1:M, M:N). (5)
- (b) Explain the process of converting ER diagram to database design. (10)
- 4. Describe the components of an ER diagram. Draw an ER diagram for a library management system. Make necessary assumptions. (15)
- 5. (a) What is normalization? Differentiate between 1NF, 2NF, and 3NF with the help of a suitable example. (10)
- (b) Explain the relational data model and its components. (5)

- 6. (a) Consider the following unnormalized table: (10)

Student ID	Student Name	Course ID	Course Name	Instructor	Instructor Phone
101	Asha	C1	DBMS	Ravi	9876
101	Asha	C2	Java	Meena	9123
102	Rahul	C1	DBMS	Ravi	9876

Identify functional dependencies. Convert the table into 1NF and then convert it into 2NF.

- (b) What is a foreign key? Explain with example. (5)
- 7. Write short notes on (any **three**): (15)
- (a) DBMS Architecture.
- (b) Relationships.
- (c) Constraints in ER Diagrams.
- (d) Composite Attributes.