UG 4th - Semester Examination - 2025 (Under NCCF)

Award	**:**	**B. Sc.**
Discipline	**:**	**Computer Science**
Course Type	**:**	**MNC-4 (Minor)**
Course Name	**:**	**Database Management System**
Course Code	**:**	**BSCCOSMN401**
Full Marks	**:**	**35** **Time: 2 Hours**

(The figures in the right-hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable. Notations and symbols have their usual meaning.)

1. Answer any *five* of the following questions. **1X5=5**

a) What is relation in DBMS?
b) What do you mean by data redundancy?
c) What is database anomaly?
d) Write full form of ACID in database transactions.
e) What are the main drawbacks of traditional file management systems?
f) What is primary key?
g) Write a basic SQL query to select all records from a table called "Customer".
h) What is a derived attribute? Give an example.

2. Answer any *five* of the following questions. **2X5=10**

a) What is natural join? Give an example.
b) What do you mean by referential integrity? Give example.
c) Explain the difference between DDL and DML with examples.
d) What is the difference between a strong and a weak entity set?
e) What is the difference between composite attribute and multi valued attribute?
f) What do you mean by closure of a set of functional dependency? Give example.
g) What is partial functional dependency? Give an example.
h) What do you mean by concurrent transaction?

3. **Answer any *two* of the following questions.** **5X2=10**

a) Explain the following operations of relational algebra – Project, Union, Cartesian Product, Division and Outer Join.

b) Explain five aggregate functions in SQL with syntax and example.

c) Discuss the concept of lossless join decomposition with an example. Why is it important in database design? 4+1

d) What is cardinality ratio? Describe in brief different types of cardinality ratio with suitable example. 2+3

4. **Answer any *one* of the following questions.** **10X1=10**

a) i) Explain 3-tier architecture in DBMS.
ii) Construct an ER diagram corresponding to customer, loan and loan payment in a banking system. 5+5

b) Consider the following relation scheme:

Employee (emp-name, street, city)
Works (emp-name, company-name, salary)
Company (company-name, city)
Manages (emp-name, manager-name)

Write down the following queries in relational algebra or SQL. 2X5

i. Find the names of all employees who work for First Bank Corporation.
ii. Find the names of all employees who live in the same city as the company for which they work.
iii. Find the names of all employees who live in the same city and same street as do their managers.
iv. Find the name of all employees who earn more than every employee of Small Bank Corporation.
v. Find the name of all employees who do not work for First Bank Corporation.

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