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2406E773

Candidate's Seat No:____

IM.Sc (CS) (NEP) Sem.2 Examination

Database Management Systems

June-2025

Date : 24/6/2025, Tuesday
Time : 2.00 Hours]

[Max. Marks : 25

Q-1 **10**

A. **Attempt the following** **5**

I. Define a Database Management System. List its key advantages over traditional file systems. 3

II. Explain the following terms with examples: 2
I. Data II. Meta Data

B. **Attempt the following** **5**

I. Draw an ER diagram for a **Library Management System** with the following entities and relationships:

- Book, Member, and Issue
- Each Book has attributes: BookID, Title, Author
- Each Member has MemberID, Name
- A Member can issue multiple books
- Include cardinality and keys

OR

Q-1 **Attempt the following** 10

A. Define DBMS. Discuss its components and advantages over traditional file systems. 5

B. Explain the three levels of database architecture with a neat diagram. 5

Q-2 **Attempt the following** 10

A. Define Primary Key, Foreign Key, and Candidate Key with examples. 5

B. Explain **Relational Algebra** operations with examples: 5
i. Selection (σ)
ii. Projection (π)
iii. Union (∪)
iv. Set Difference (-)
v. Cartesian Product (×)

OR

Q-2 **Attempt the following** 10

A. **Relation:** R=(A,B,C,D,E) 2+3=5

Functional Dependencies (FDs):

1. A→BC
2. C→D
3. BE→C
4. D→A

1. Calculate: A^+, B^+.

P. T. O

E-773-2

A. Find a candidate key for relation R. Describe all the steps to determine candidate key.

B. Explain different types of constraints in relational databases: 5

Q-3 Do as Directed 5

1. What is logical data independence?
2. What is schema and instance in a database?
3. State the difference between a strong and weak entity
4. State True or False with justification. Without proper justification you will not get full marks.

   A relation with only two attributes is always in BCNF
5. State True or False with justification. Without proper justification you will not get full marks.

   A relation is in 3NF is always in 1NF.