

(3 Hours)

[Total Marks: 80]

- N.B.:-** (1) Question No. 1 is **Compulsory**.  
(2) Solve any **three** questions from the remaining **five** questions.  
(3) **Figures** to the **right** indicate **full** marks.  
(4) Make **suitable** assumptions wherever **necessary** and state them **clearly**.

1. (a) Define generalization and specialization. **5**  
(b) Explain different keys in DBMS. **5**  
(c) Explain role of DBA. **5**  
(d) Compare traditional file system with DBMS. **5**
2. (a) List the functional dependencies which satisfy the relation **10**

X	y	z
X1	Y1	Z1
X1	Y2	Z1
X2	Y2	Z1
X2	Y2	Z1

- (b) Suppose you are given the following requirements for a simple database of the National Cricket Trophy (NCT): **10**
- the NCT has many teams,
  - each team has a name, a city, a coach, a captain, and a set of players,
  - each player belongs to only one team,
  - each player has a name, a position (such as left wing or goalie), a skill level,
  - and a set of injury records,
  - a team captain is also a player,
  - a game is played between two teams (referred to as host team and guest team) and has a date (such as May 11th, 1999) and a score (such as 4to 2).

Construct ER diagram for the NCT database.

3. (a) Explain different types of operations in relational algebra. **10**  
(b) Explain Joins and types of Joins with suitable example. **10**
4. (a) Define Normalization. Explain 1NF,2NF and 3NF with suitable example. **10**  
(b) Consider the following schema for College Library. **10**

Student (Roll\_no, Name, Branch)

Book (ISBN, Title, Author, Publisher)

Issue (Roll\_no, ISBN, Date\_of\_Issue)

Write SQL queries for the following statements:

- i. List Roll Number and Name of all students of the branch IT.
- ii. Find the name of students who have issued a book published by 'XYZ' publisher.
- iii. List title of all books and their author issued by student 'Alice'
- iv. List title of all books issued on or before 31<sup>st</sup> DEC, 2019

5. (a) Explain Event Condition Action (ECA) model with suitable example. **10**
- (b) Explain types of Integrity Constraints with example. **10**
6. Write note on (**any four**): **20**
- (a) DDL commands.
- (b) Hashing Techniques.
- (c) Data Independence.
- (d) Types of attributes.
- (e) Aggregate function in SQL.

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