

(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 31st 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.