

2024

Time : 3 hours

Full Marks : 70

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer all sections as directed.

Section–A

Objective type Questions

Compulsory

1. Choose the correct answer of the following multiple choice questions : $2 \times 10 = 20$
 - (a) Which command is used to remove all records from a table but keeps its structure?

- (i) DELETE
 - (ii) TRUNCATE
 - (iii) DROP
 - (iv) REMOVE
- (b) What is the purpose of a foreign key in a database?
- (i) To store encrypted data
 - (ii) To link two tables together
 - (iii) To speed up queries
 - (iv) To define the primary key
- (c) What is the main purpose of normalization in a database?
- (i) To reduce data redundancy and improve data integrity
 - (ii) To increase query execution speed
 - (iii) To merge multiple tables into one
 - (iv) To create indexes for faster searching

- (d) What is Database Management System (DBMS)?
- (i) A collection of data
 - (ii) A software used to manage database
 - (iii) A programming language
 - (iv) A hardware device
- (e) What is metadata in DBMS?
- (i) The actual data stored in the database
 - (ii) Data about data
 - (iii) A backup of the database
 - (iv) Encrypted database information
- (f) The process of ensuring that a database remains accurate and consistent is called:
- (i) Data security
 - (ii) Data integrity
 - (iii) Data redundancy
 - (iv) Data filtering

- (g) What is the purpose of the "schema" in a database?
- (i) To define structure of a database
 - (ii) To store backup data
 - (iii) To write queries
 - (iv) To delete unwanted records
- (h) Which normal form is based on functional dependencies and ensures no partial dependency exists?
- (i) 1NF
 - (ii) 2NF
 - (iii) 3NF
 - (iv) BCNF
- (i) `SELECT name, Salary FROM Employees WHERE Salary = (SELECT MAX(Salary) FROM Employees);`
- (i) Displays the highest salary in the company

- (ii) Displays the names of employees who earn the highest salary
 - (iii) Displays all employees except the highest paid one
 - (iv) Displays all employee names and their salaries
- (j) Which type of database stores data in tables with relationships between them?
- (i) Hierarchical database
 - (ii) Network database
 - (iii) Relational database
 - (iv) File System

Section-B

Short Answer type Questions

Answer any **four** questions of the following :

5×4=20

2. What is Normalization? Explain 1st, 2nd and 3rd Normal Forms with examples.

3. What is data independence in DBMS? Explain the difference between logical and physical data independence with examples.
4. What is the difference between specialization and generalization?
5. What do you understand by Data Constraints in SQL? Explain various types with the help of examples.
6. Define E-R model with examples.
7. Differentiate between Primary key and Foreign key with examples.
8. Explain the purpose of the GRANT and REVOKE commands in database security.

Section-C

Long Answer type Questions

Answer any **two** questions of the following :

15×2=30

9. Write SQL command for the following on the basis of given table: STUDENTS

Student ID	Name	Age	Department	Marks
101	John Doe	21	Computer Science	85
102	Alice Smith	22	Information Technology	78
103	Bob Johnson	20	Electronics	90
104	Emma Brown	23	Computer Science	88
105	Charlie Lee	19	Information Technology	75

- (a) Retrieve all student records.
- (b) Display the names and departments of students above 20 years old.
- (c) Display student details sorted by marks in descending order.
- (d) Insert a new student with student ID 106, Name 'David Wilson', Age 22, Department 'Electronics', and Marks 80.

10. (a) Explain DDL statements with syntax and examples.

(b) What is JOIN operation? Explain different joins with syntax and example.

11. Write short notes on:

(a) Foreign Key

(b) Schema and Instances

(c) Database Privileges

12. Elaborate the three-level architecture of Database System.

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