

1. All questions are compulsory.
2. All questions carry equal marks.
3. Draw neat, labelled diagrams wherever necessary

Q.1 Attempt the following (Any Four)

[20 Marks]

- a. Write a short note on two-tier architecture of DBMS.
- b. Explain Hierarchical data model.
- c. Write a short note on Specialization.
- d. Construct an ER diagram for a publication may be a book or an article. Articles are published in journals. Publication has title and location. Book having their title and category. Article includes title, topic and date. Publication is written by authors stores name, address and mobile number. Publication also belong to particular subject which has their names.
- e. Explain the following statement.
 - i) CREATE
 - ii) ALTER
- f. Explain any four aggregate functions with suitable example.

Q.2 Attempt the following (Any Four)

[20 Marks]

- a. Explain types of Relational Constraints.
- b. Explain the following.
 - i) ABS
 - ii) TRUNCATE
 - iii) ROUND
 - iv) FLOOR
 - v) SQRT
- c. What are Joins? Explain Left Join and Right Join with suitable example.
- d. For the given database, write down SQL queries.

Student (rollno, sname, subject, dob, grade)
 course(course_id, course_name, dept_name)
 enroll (rollno, course_id)

 - i) Write a query to select all courses available in institute.
 - ii) Find all student details registered for course id 2. (Solve with Subquery)
 - iii) Find out all courses whose name starts with 'C' and 'E' as third character.
 - iv) Find all students belong to "CS" department.
 - v) Display total number of students of each grade.
- e. Explain the following-
 - i) IN
 - ii) ALL
- f. Explain the concept of Primary key and Foreign key with suitable example.

Q.3 Attempt the following (Any Four)**[20 Marks]**

- a. Write a short note on Lossless join Decomposition.
- b. Write a short note on Normalization. Also explain 1NF and 2 NF.
- c. Explain the Database security with its requirements.
- d. What is View? How it is created?
- e. What do mean by index? Explain the concept of primary index.
- f. Define database backup. How database backup helps to avoid failures?

Q.4 Attempt the following (Any Five)**[15 Marks]**

- a. Define following terms.
 - i) Composite Attribute
 - ii) Multivalued Attribute.
 - iii) Entity Set.
- b. Explain the following :-
 - i) One-to-One
 - ii) One-to-Many
 - iii) Many-to-Many
- c. Explain concept of database recovery and also explain the techniques.
- d. Write short note on Access Control.
- e. What is DBA? Explain any three roles of DBA.
- f. Write a short note on
 - i) Transaction management
 - ii) Restoring Data