Q. P. Code:-22552

(3 Hours) **Total Marks: 80**

N.B.: (1) Question No.**1** is **compulsory**.
(2) Solve any **three** questions out of the remaining questions.
(3) Make **suitable** assumptions if **needed**.

1. (a). Explain ACID properties. **5**
(b) Discuss Generalization and Specialization in EER model. **5**
(c) Explain Aggregate Functions in SQL. **5**
(d) Describe Triggers with example. **5**

2. (a) Define Normalization. Discuss different Normalization Techniques with example. **10**
(b) Consider the following database schema: **10**
Employee(employee_name, street, city, date_of_join)
Works(employee_name ,company_name, salary)
Company(company_name, city)
Manages(employee_name, manager_name)
Solve the following queries using SQL:
i. Give all employee of ABC Company a 25% rise.
ii. Find all employees who live in the same cities and on the same street as their manager.
iii. Find all employees who join in the month of April.
iv. Delete the employee Jennifer belonging to XYZ Company.

3. (a) Explain types of integrity constraints with example. **10**
(b) Describe the overall architecture of DBMS with suitable diagram. **10**

4. (a) Draw an ER Diagram and convert it into relational model for a Hospital with a set of patients and set of doctors. Associate with each patient a log of various tests and examinations conducted. **10**
(b) Explain Security and Authorization in DBMS. **10**

5. (a) Explain the following Relational Algebra Operations with example: **10**
i. Cartesian Product iii. Generalized Projection
ii. Natural Join iv. Union
(b) Discuss conflict serializability and view serializability with examples. **10**

6. Write Short notes on: **20**
(a) Steps in Query Processing
(b) Role of Database Administrator
(c) Deadlocks
(d) Data Independence

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