QP Code : 1362

(3 Hours)
[Total Marks : 100]

N.B : (1) Question No. 1 is compulsory.

(2) Attempt any four questions out of the remaining six questions.

1) (a) Draw an E-R diagram for railway management system. Convert the E-R diagram into a relational schema. (10)

(b) Define Normalization. Explain 1NF, 2NF, 3NF and BCNF with suitable examples. (10)

2) (a) Explain two phase locking protocol. (10)

(b) Consider an employee database where the primary keys are underlined. Give an expression in SQL for the following queries:- (10)

Employee (employee_name, street, city)

Works (employee_name, company_name, salary)

Company (company_name, city)

Manages (employee_name, manager_name)

(i) Find the names and cities of all employees working for 'StarComp'.

(ii) Find all the employees in the database who do not work for 'Bluestar'.

(iii) Find all employees in the database who earn more than every employee of 'Smartcorp'.

(iv) Find the names of all employees having 'a' as the second letter in their names.

(v) Display the annual salary of all the employees.

3) (a) Give advantages of DBMS over file processing system. (10)

(b) What do you mean by deadlocks in database system? Explain how it is prevented. (10)

4) (a) Define the following terms with an example : (10)

(i) Simple and Composite attribute

(ii) Data Manipulation Language

(iii) Project operator in relational algebra

(iv) View

(v) Total and partial participation

(b) What is a transaction? Discuss state transition diagram and properties of transaction. (10)

5) (a) Compare shadow page recovery scheme with log based recovery scheme. (10)

   (b) Explain the following joins with an example :-   (10)

    (i)   Inner Join

    (ii)   Left Outer Join

    (iii)   Right Outer Join

    (iv)   Natural Join

    (v)   Full Outer Join

6) (a) Discuss the different security and authorization mechanisms in database management system.   (10)

   (b) Explain insertion of entry in B+ Tree.   (10)

7) Write short notes on (any four):-   (20)

    a.   Aggregate functions

    b.   Hashing technique

    c.   Buffer management

    d.   Group by and Order by clause in SQL

    e.   Data Independence and its types

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