5E5044

B. Tech. V Semester (Main) Examination, Dec., 2014
ELECTRICAL ENGINEERING # 5EE4A
Database Management System

Time : 3 Hours   Min. Passing Marks : 24   Maximum Marks : 80

Instruction to Candidates :

Attempt any **five** questions, selecting **one** question from **each** unit. All questions carry **equal marks**. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

Unit-I

1. (a) Define database and DBMS. How database approach is better than the traditional file approach? Explain [8]

   (b) Design an ERD for Airlines Reservation System consisting of flights, aircrafts, airports, fares, reservation, tickets, pilots, crew and passengers. Clearly highlight the primary keys and mapping cardinalities. [8]

OR

1. (a) Explain the components of DBMS. Also draw a neat diagram of the DBMS architecture. [8]

   (b) Differentiate between the following : [4×2=8]
   - (i) Ternary Relationship and Aggregation
   - (ii) Specialization and Generalization
   - (iii) Super, Candidate and Primary keys
   - (iv) Entity Sets, Attributes and Relationship Sets.

Unit-II

2. (a) What is normalization? Explain its need. Define various normal forms with example. [8]

   (b) Consider the following relations schemas: [4×2=8]
   Shop (Shop-No, Sh-name, Sh-address)
   Shop owner (Name, adders)
   Owns-shop (Name, Shop no)
   Customer (C-Name, C-address)
   requires (C-Name, item)
   has-stock (shop no, item)
   supplies (Shop-no, C-Name, Item, price)
   Write down the following queries in relational algebra–
   - (i) Find the name of shop owners who supply some items to address 134, Mahatma Gandhi Road.
   - (ii) Find the names of customers who have been supplied items of maximum total value.
   - (iii) Find the name of customers who require the items which have not been supplied. List both the customers and the items.
   - (iv) Find the names of customers who are supplied all their required items from a particular shop.

OR

2. (a) Give formal Definitions of TRC and DRC. What is meant by safety of expressions? [8]

   (b) Consider the following relation schema- [4×2=8]
   Employee (person-name, street, city)
   Works (person-name, Company-name, salary)
   Company (company-name, city)
   Manager (person-name, manager-name)
   Write the following queries in Relational Algebra-
   - (i) Find the names of all employees who work for "First Bank".
   - (ii) Find the names of all employees who live in the same city as the company for which they work.
   - (iii) Find the names of all employees who live in the same city and on the same city as do their managers.
   - (iv) Find the name of all employees who don't work for "Small Bank".

Unit-III

3. (a) Explain Embedded SQL and its need. How is it different from Dynamics SQL? [8]

   (b) Define a trigger. What are the uses of creating triggers? Explain with examples. [8]

OR

3. (a) Explain the following clauses of SQL- [4×2=8]
   - (i) ORDER BY
   - (ii) GROUP BY
   - (iii) HAVING
   - (iv) EXCEPT

   (b) What is a view? How can a view be used to implement database security? Explain with examples. [8]

Unit-IV

4. (a) What is Hashing? Explain its implementation by explaining one Hashing Technique. [8]

   (b) What are various types of Indexes? Explain with examples. [8]

OR

4. (a) Explain a B^+ Tree node structure. Create a B^+ Tree of order 3 having the following key values- 105, 210, 350, 781, 50, 79, 73, 97, 500, 61, 100, 102, 49, 48. [8]

   (b) Explain the node structure of B Tree. What are the differences between B and B^+ Tree indexes? Explain. [8]

Unit-V

5. (a) Define a Transaction. What are the properties of a Transaction? Explain various Transaction States with a neat diagram. [8]

   (b) What is a Deadlock? Explain various techniques of handling deadlocks. [8]

OR

5. (a) Define serializability. What are its various types? Explain. [8]

   (b) What all types of failures can occur in database systems? Explain various log based recovery techniques in detail. [8]