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2023

Reg. No. :

Name :

Fourth Semester B.Tech. Degree Examination, May 2014
(2008 Scheme)
Branch : INFORMATION TECHNOLOGY
08.406 : Data Base Design (F)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. What are the different types of database end users ? Briefly explain the main activities of each.
2. What is meant by a recursive relationship type ? Give an example.
3. Explain the entity integrity and referential integrity constraints.
4. Explain how the group by clause works.
5. What is external hashing ?
6. What is an aggregate function ? Give an example.
7. Define join dependency and PJNF.
8. How does disk mirroring help improve reliability ?
9. Explain the violations caused by dirty read and phantoms.
10. Explain the wait-die and wound-wait protocols for deadlock prevention.

(10×4=40 Marks)

PART – B

Answer **any one** question from **each** Module.

Module – I

11. a) Describe the three-schema architecture. Why do we need mappings between schema levels ? **10**
b) A bank has many branches and a large number of customers. A customer can open different kinds of accounts with the bank. The bank keeps track of a

P.T.O.



customer by his SSN, name, address, and phone number. Age is used as a factor to check whether he is a major. There are different types of loans, each identified by a loan number. A customer can take out more than one type of loan, and all branches can give loans. Loans have a duration and interest rate. The account holder can enquire about the balance in his account. Draw an ER diagram for the bank. 10

OR

12. a) Consider the following relational schema for a book club :

Members (Member_id, Name, Designation, Age) Books (Bookid, Btitle, Author, Publisher, Price) Reserves (Member_id, Bookid, date).

Write the following queries in relational algebra.

- i) Find the names of members who are professors older than 45 years.
- ii) List the titles of books reserved by professors.
- iii) Find the member id of members who have not reserved books that cost more than Rs. 500/-
- iv) Find the authors and titles of books reserved on 28-Feb-2010.
- v) Find the names of members who have reserved all books. 10

b) Explain any five advantages of using a DBMS. 10

Module – II

13. a) Explain the different ways by which a join operation can be modeled using SQL. 10

b) Explain the dependency preservation property and lossless join property of a decomposition. 10

OR

14. a) Consider the following tables :

Employee (Empid, Empname, Salary)

Works (Empid, Deptid)

Department (Deptid, Deptname, Managerid, Floornum).

(An employee can work in more than one department)



Write the following in SQL

- i) Print the names of all employees who work on the 10th floor and earn salary less than Rs. 50,000.
 - ii) Print the names of the departments that employee Smith works in
 - iii) Print the names of all managers who manage three or more departments on the same floor.
 - iv) Print the names of all employees who work on floor(s) where Peter works.
 - v) Give every employee who works in the toys department a 10% increase in salary. 10
- b) Write the algorithm for finding a minimal cover F for a set of functional dependencies E. A set of FDs for the relation R {A, B, C, D, E, F} is $AB \rightarrow C$, $C \rightarrow A$, $BC \rightarrow D$, $ACD \rightarrow B$, $BE \rightarrow C$, $EC \rightarrow FA$, $CF \rightarrow BD$, $D \rightarrow E$. Find a minimum cover for this set of FDs. 10

Module – III

15. a) Construct a B+ tree for the following set of key values : 2, 3, 5, 7, 11, 17, 19, 23, 29, 31. Assume that the tree is initially empty and values are added in ascending order. Also assume that the number of pointers that will fit in one node is four. 8
- b) Explain concurrency control based on timestamp ordering. 12
- OR
16. a) Explain write ahead logging protocol. 10
- b) Write an algorithm for testing the conflict serializability of a schedule. 10
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