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2341

Reg. No. :

Name :

**Fourth Semester B.Tech. Degree Examination, May 2013
(2008 Scheme)**

**Branch : Information Technology
08.406 : DATA BASE DESIGN (F)**

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **4** marks.

1. What do you mean by data independence ?
2. What is recursive relationship ?
3. What is the advantage of using natural join over equijoin ?
4. List various aggregate functions used in SQL.
5. What is functional dependency ?
6. How will you show that the given two sets of dependencies are equivalent ?
7. "A binary relation is always in BCNF". Justify the above statement.
8. What are ACID properties ?
9. Discuss dirty read and phantom read.
10. What is the role of a transaction manager and recovery manager ?

(10×4=40 Marks)

P.T.O.



PART – B

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

Module – 1

11. a) Draw an entity relationship diagram for a library management system involving books, publishers, borrowers, suppliers, authors. Include any entities and attributes relevant to the system. State the assumptions you have made. 10
- b) What do you mean by constraints ? Discuss the different constraints used in DBMS. 10

OR

12. a) Consider the database of a company involving tables namely Employee, Department, Project, Works-on, with the following attributes :
- Employee (E_id, E_name, salary, D_no)
Department (D_no, D_name, Location)
Project (P_no, P_name, D_no, Location)
Works_on (E_id, P_no, Hours)
- Write relational algebra expressions for the following statements :
- i) Retrieve the name and address of all employees who work for the "Research" department. 3
- ii) Find the names of employees who work on all projects controlled by department number 5. 3
- iii) Find the names of employees who work on atleast one project located in "Houston". 4
- b) Discuss left outer join and right outer join with suitable example. 5
- c) What is a weak entity ? How will you specify a key and a relationship for a weak entity in ER diagram ? 5

**Module – 2**

13. a) Consider a database of a company involving tables namely supplier, parts, shipment, project with the following attributes :

Supplier (S_id, S_name, Status, City)

Parts (P_no, P_name, Color, Weight, City)

Project (J_no, J_name, City)

Shipment (S_id, P_no, J_no, Quantity)

Write SQL statements for the following :

- i) Find the list of suppliers who supply more than 3 projects. 3
 - ii) Increase the number of “steel rods” to be supplied for “construction” project by 100. 4
 - iii) Delete the details of shipment of “construction” project. 3
- b) A relation R(A B C D E F) with functional dependencies $F = \{A \rightarrow B, C \rightarrow DE, AC \rightarrow F\}$ and the decomposition S(AB), T(CDE) and U(ACF). Check whether the decomposition is lossless or lossy. 5
- c) Find the highest normal form of the relation R(A B C D E) with functional dependencies, $F = \{A \rightarrow BCDE, B \rightarrow C, D \rightarrow E\}$. Also justify your answer. 5
- OR
14. a) What is a minimal cover for dependencies ? How is it determined ? 5
- b) Write the algorithm for finding the closure of an attribute. 5
- c) Check whether the following statements are true or false ? Justify your answer.
- i) The relation R(A B C D E) with functional dependencies $F = \{AB \rightarrow CDE, C \rightarrow A, D \rightarrow E\}$ is in BCNF. 4
 - ii) The relation R(ABCD) with functional dependencies $F = \{A \rightarrow BCD, B \rightarrow CD, C \rightarrow D\}$ is in 3NF. 3
 - iii) The relation R(ABCD) with functional dependencies $F = \{A \rightarrow B, B \rightarrow C, C \rightarrow D\}$ is in 2NF. 3

**Module – 3**

15. a) Explain primary index, secondary index and clustering index in files. 10
- b) How will you test the conflict serializability of a schedule ? 5
- c) Test whether the given schedules are conflict serializable or not by drawing the corresponding precedence graph.
- i) $r_1(X); r_3(X); w_1(X); r_2(X); w_3(X);$
- ii) $r_1(X); r_3(X); w_3(X); w_1(X); r_2(X);$ 5
- OR
16. a) Explain B tree and B⁺ tree. 10
- b) Explain recovery techniques based on deferred update and immediate update. 10
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Fourth Semester B.Tech. Degree Examination, May 2013
(2008 Scheme)
08.405 : DATA STRUCTURES AND ALGORITHMS (RF)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions

1. Define priority queue. Give any one application.
2. What is meant by structured programming ?
3. What is the use of frequency count in analyzing algorithms ?
4. Give the prefix and postfix representations for the following infix expression :
(a + b) * c - d/f + g + h.
5. Explain how a binary tree is represented using one dimensional array.
6. List any two applications of graph data structure.
7. Write a short note on garbage collection.
8. The Ackerman function, for all non-negative values of m and n is recursively defined as :

$$A(m, n) = \begin{cases} n + 1 & , \text{ if } m = 0 \\ A(m - 1, 1) & , \text{ if } m \neq 0 \text{ but } n = 0 \\ A(m - 1, A(m, n - 1)) & , \text{ otherwise} \end{cases}$$

What is the value of A (2, 2) ?

9. What is hashing ?
10. What is the maximum number of edges in a n-node undirected graph without self loop ?

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LIBRARY

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PART – B

Module – I

11. a) Explain the implementation of two stacks using one array, efficiently.
b) Explain the algorithm for inserting a node into a doubly linked list.

OR

12. a) Explain the representation of polynomial using linked list. Use it for adding two polynomials.
b) Explain stepwise refinement techniques.

Module – II

13. a) Write a non-recursive algorithm for inorder traversal.
b) Explain any two methods of representing graphs, with examples.

OR

14. a) Write an algorithm to delete a node from a given binary search tree. Give examples.
b) Explain storage compaction.

Module – III

15. a) Explain quick sort algorithm. Derive its best case and worst case time complexity.
b) Explain collision resolution techniques.

OR

16. a) Explain the working of heap sort algorithm for the following input :

35, 37, 61, 84, 73, 25, 53, 46, 39, 93.

b) Explain :

- i) insertion sort algorithm and
ii) binary search algorithm.

(3×20=60 Marks)