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MANIPAL INSTITUTE OF TECHNOLOGY,
(A Constituent Institute of MANIPAL UNIVERSITY)
MANIPAL - 576 104, Karnataka, India.

IV SEMESTER B.E. (CSE) (Revised credit scheme)
END SEMESTER EXAMINATION May- 2009
SUBJECT : DATABASE MANAGEMENT SYSTEMS(CSE-206)

TIME : 3 HOURS **16-5-2009** **MAX.MARKS : 50**

Note : Answer any FIVE full questions. Missing data can be assumed.

1A. Explain the three levels data abstraction of DBMS. Illustrate with an example. (2+2)

1B. What are NULL values? Why they are required? What is the result of applying arithmetic and comparison operations on NULLs? (3)

1C. What is the difficulty in applying updates, insertions and deletions on Views? Under what conditions, a view is said to be updatable? (2+1)

2A. Consider the relational schema of a College Database:
Course(CourseID, CName, NoOfPapers, Fees)
Student(RollNo, Name, Age, City, CourseID)
Result(RollNo, CourseID, PaperNo, Marks,)
Note: PaperNo can have a value between 1 and NoOfPapers of the corresponding course
Write the following queries in SQL:

i. Find the number of students above age 20 in each course
ii. Get the details of all the courses joined by the students
iii. Get the result(marks in different papers) of all the students who are enrolled in the same course as the student with RollNo 12
iv. Find out the names of all the students who appeared in more than three papers of their opted course without using GROUP BY clause. (1+1+1+2)

2.B. Briefly explain the following terms with example.
i) entity ii) attribute iii)domain iv) relationship. (2)

2.C. Discuss the following design issues in entity-relationship model:
i) use of entity sets v/s relationship sets
ii) binary v/s n-ary relationship sets
iii) placement of attributes. (3)

3A. Consider a MAIL_ORDER database in which employees take orders for parts from customers. The data requirements are summarized as follows:

- The mail order has employees each identified by a unique employee number, first and last name and ZIP code.
- Each customer of the company is identified by a unique customer number, first and last name and ZIP code.
- Each part sold by the company is identified by a unique part number, a part name, price and quantity in stock.

- Each order placed by a customer is taken by an employee and is given a unique order number. Each order contains specified quantities of one or more parts. Each order has a date of receipt as well as an expected ship date. The actual ship date is recorded.

Design an entity relationship diagram for the mail order database. (3)

3.B. Explain with example:

i)generalized projection ii) aggregate function. iii) outer join (3)

3.C. For the following relations of a book club:

Members(Mid, name, designation, age)

Books(Bid, Btitle, Bauthor, Bpublisher, Bprice)

Reserves(Mid, Bid, Date)

Write the relational algebra expressions for the following:

i. List the titles of books reserved by professors.
ii. Find IDs of members who have not reserved books that cost more than Rs. 500.
iii. Find the authors and titles of books reserved on 27-may-2008.
iv. Find the names of members who have reserved all books. (4)

4A i. Give the formal definition of functional dependency.

ii. List all functional dependencies satisfied by the relation

A	B	C	D
a1	b1	c1	d1
a1	b1	c2	d2
a1	b2	c2	d1
a1	b2	c4	d4

iii. Find the minimal cover for the given set of FDs

B->A, D->A, AB->D (1+1+2)

4B i.. Define 3NF and 4NF (2)

ii: State BCNF decomposition algorithm. Apply the same to give a lossless BCNF decomposition of R and functional dependency F given below

$R = (A, B, C, \underline{D}, \underline{E}, F)$

$F = \{A \rightarrow C\ B;\ E \rightarrow F\ A\}$ (4)

5A i. Define serializable schedule.

ii. Explain the notion of conflict serializability.

iii. Explain the different states of a transaction. (1+2+2)

5B i.. Explain the techniques used for the optimization of Disk Block Access. Also brief about the Elevator algorithm (2+1)

ii. Explain Multitable Clustering File Organization with Example. (2)

6A. Explain the concept of Dense and Sparse Index files. Also brief about the Insertion and deletion of records in both of the files. (2+1)

6B. Mention the Advantages and Drawback of static hashing. And brief about the Multilevel Indices with Example. (2+1)

6C.Suppose that we are using extendable hashing on a file that contains records with the following search key values:

2,3,5,7,11,17,19,23,29,31.

Show the extendable hash structure for this file if the hash function is h(x)=x mod 8 and buckets can hold three records.

Show how the extendable hash structure of example changes as the result of each of the following steps:

Delete 11

Insert 1 (4)