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Total number of printed pages – 3

**B. Tech**

**PCCS 4205**

## Fourth Semester Examination – 2011

### DATABASE ENGINEERING

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory and any **five** from the rest.  
The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2 × 10
  - (a) Give two examples of DCL.
  - (b) List four significant differences between a file processing system and a DBMS.
  - (c) Give an example of a weak entity set and explain why it is weak.
  - (d) What is cardinality ? How many types of cardinality are available ?
  - (e) When a functional dependency F is said to be minimal ? Give an example.
  - (f) Define foreign key. Write an example to explain it.
  - (g) Write down four differences between static hashing and dynamic hashing.
  - (h) Distinguish between shared lock and exclusive lock.
  - (i) What is the difference between object oriented and object relational database ? Give an example.
  - (j) What do you mean by rollup ? Explain using an example.
2. (a) More than one teacher can teach a course. A student can register to any one teacher for the course. Draw the ER diagram and convert it to Relational model. 5
- (b) How to convert a network model to relational model ? Explain using an example. 5

**P.T.O.**

3. How to insert, delete and update a B+ tree ? Explain using example. 10

4. (a) Consider the following relations : 5

Student (Rollno, Name, Subject, Marks)

Teacher (Tid, Tname, Subject, Rollno)

Write the following queries in relational algebra :

(i) Find the name of those students who have registered with teacher 001.

(ii) Find the name of those teachers who have more than 5 registered students.

(b) Consider the following relations : 5

EMPLOYEE (Emp\_Code, Emp\_Name, Desig, Mgr\_No, Doj, Salary, Comm, Dept\_Code)

DEPARTMENT (Dept\_Code, Dept\_Name, Location)

Write the following queries in relational calculus :

(i) Find the name and Emp\_Code of all employees who work for the "Computer Science" Department.

(ii) Find the name of all employees whose salary is above Rs. 25000/- along with their department name.

5. (a) Consider the following relations : 5

Student (Rollno, Name, Subject, Marks)

Write the following queries in SQL :

(i) Find the name of those students who have secured more than the average marks in the class ?

(ii) Find the name of those students who have secured the highest mark in each subject ?

(b) Consider the following relations : 5

Student (Rollno, Name, Subject, Marks)

Teacher (Tid, Tname, Subject, Rollno)

Write the following queries in QBE :

(i) Find the name of those students who have registered with teacher 001.

(ii) Find the name of those students who have secured the highest mark in the class ?

6. (a) Explain Multivalued dependency with examples. 5  
(b) Consider the following relations : 5  
Student (Rollno, Name, Subject, Marks)  
Teacher (Tid, Tname, Subject, Rollno)  
Draw the relational algebra tree for finding the name of those students who have registered with teacher 001. Find the costs associated with various operations involved in the above query and write a process to optimize it.
7. (a) What is Serialize ? Give some examples for testing of Serializability. 5  
(b) What is timestamp ? Explain with examples. 5
8. Write short notes on any **two** of the following : 5×2  
(a) Data Independence  
(b) RAID  
(c) Thomas Write Rule  
(d) Phantom rows.