Reg. No. : ....

Name : ....

Fourth Semester B.Tech. Degree Examination, May 2015
13.405 : DATABASE DESIGN (FR)

Time : 3 Hours

Max. Marks : 100

PART – A

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

1. Why would choose a database system instead of simply storing data in operating system files ?

2. Explain the set operators in relational algebra with adequate examples.

3. How does BCNF differ from 3NF ?

4. What are different steps in processing a query ?

5. Differentiate static hashing from dynamic hashing. **(5×4=20 Marks)**

PART – B

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

Module –1

6. a) Give the limitations of ER model. How do you overcome these limitations ?   5

   b) Explain the three schema architecture with a neat diagram.   10

   c) What is aggregation ? Give an example.   5

7. a) Draw an E-R diagram for an airline reservation system consisting of flights, aircrafts, airports, fares, reservations, tickets, pilots, crew and passengers. Clearly highlight the entities, the relationship, the primary keys and the mapping constraints.   10

   b) Compare and constrast various data with examples.   10
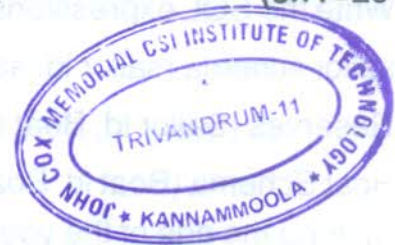
Module – 2

8. a) Discuss about triggers. How do triggers offer a powerful mechanism for dealing with the changes to database with suitable example. 10

   b) Consider the following database

   Employee (employee-name, street, city, salary)

   Works (employee-name, company-name)

   Company (company-name, city)

   Give an expression in the relational algebra, for the following query.
   i) Find names of employee working in the company 'xyz limited'
   ii) Find name of employee with highest salary
   iii) Find names of employees whose salary is greater then 5000
   iv) Find names of employees working in 'Trivandrum' city. 10

OR

9. a) What are the SQL constructs to modify the structure of tables, view and to destroy the tables and views ? Give examples. 8

   b) Write the SQL expressions for the following relational database.

   sailor schema (sailor id, sailorname, rating, age)

   Reserves (Sailor id, Boat id, Day)

   Boat Schema (Boat id, Boatname, color)
   i) Find the age of the youngest sailor for each rating level.
   ii) Find the age of the youngest sailor who is eligible to vote for each rating level.
   iii) Find the No. of reservations for each red boat.
   iv) Find the average age of sailor for each rating level that at least 2 sailors. 12

Module – 3

10. a) What is minimal cover ? Write steps to find minimal cover of set of dependencies. 10

    b) What are the advantages of normalized relations over the un normalized relations ? 10

OR

11. a) What is dependency preservation property of decomposition ? Explain why it is important. 10

b) Consider the universal relation R(A, B, C, D, E, F, G, H, I, J) and the set of FD's.
G = ({A, B}->{C}->{B, D}->{E, F}, {A,D}->{G, H}, {A}->{I},{H}->{J}) what is the key of R ? Identify the normal form of the relation. 10

Module – 4

12. a) With an example, explain serial and non-serial serialazability schedule. 10

b) Explain about the B–tree file organization in detail. 10

OR

13. a) Describe each of the following locking protocols
   i) Two phase lock
   ii) Conservative two phase lock. 10

b) What are the causes of bucket overflow in a hash file organization ? What can be done to reduce the occurrence of bucket overflows ? 10