COMP – 5-5 (RC)

T.E. (Comp.) (Semester – V) Examination, Nov./Dec. 2009
DATABASE MANAGEMENT SYSTEM (RC)

Duration : 3 Hours Total Marks : 100

***Instruction** : Assume any data if required.*

Module – 1

1. a) State and explain the various functions of a Database Administrator. 5

   b) Explain the concepts of total participation and partial participation w.r.t. relationship in dbms. 5

   c) State and explain the various characteristics of the database approach that distinguishes it from traditional approach of programming with files. 10

2. a) A database is being constructed to keep track of the teams and games of a sports league. A team has a number of players, not all of whom participate in each game. It is desired to keep track of the players participating in each game for each team and the result of the game. Design an E-R diagram considering your favourite sport. 8

   b) Differentiate between aggregation and generalization with an example. 4

   c) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. 8

Module – 2

3. a) Discuss the various reasons that lead to the occurance of null valves in relations. 5

   b) Explain the following terms w.r.t. relation schema. 5

      i) Super key ii) Candidate key iii) Primary key

   c) Consider the following relations shown below.

      Works (PName, CName, Salary)

      Lives (PName, Street, City)

      Located In (CName, City)

      Managers (PName, MgrName)

      PName refers to the person name, CName refers to company name and MgrName refers to manager name and it is a foreign key that references PName of works. 10

P.T.O.

Specify the following queries in relational algebra.

a) Find the names of the person who work for the company 'IBM'

b) List the names of the person working for 'HP' along with the cities they live in.

c) Find the names of the person who live and work in the same city.

d) Find the names of person who do not work for the company 'IBM'

e) Find the names of the companies that are located in every city where the company 'HP' is located in.

4. a) What is view in SOL and how is it defined ? Discuss the problems that may arise when one attempt to update a view. 7

b) How does SOL allow implementation of the entity and referential integrity constraint ? Illustrate with suitable example. 7

c) What do you mean by safe expression in relational calculus ? Explain. 6

Module – 3

5. Write query processing briefly discuss the following algorithms.(**any 4**) 5×4=20

1) Join 2) Sorting 3) Merge-Join

4) Pipelining 5) Nested loop Join

6. a) Illustrate the following normal forms with example :

1) First Normal Form

2) Second Normal Form 5

b) R = {A, B, C, D, E, F, G, H, I, J}

FD = { AB $\rightarrow$ C

A $\rightarrow$ DE

B $\rightarrow$ F

F $\rightarrow$ GH

D $\rightarrow$ IJ }

1) Decompose R into 2 NF and 3 NF 5

2) Why do you need to normalise the tables ? 5

3) What do you mean by BCNF ? Explain with an example. 5

Module – 4

7. a) What is a schedule (history) ? Define the concepts of recoverable, cascadeless and strict schedules and compare them in terms on their recoverability. **10**

   b) Differentiate between exclusive lock and shared lock. **5**

   c) What is concurrency control ? What is its objectives ? **5**

8. a) Explain multiversion two phase locking using time stamp ordering. **8**

   b) Write 2 phase locking (2PL) discuss **12**

      1) Basis 2PL

      2) Conservative 2PL

      3) Strict 2PL

      4) Rigorous 2PL.