13614 M **COMP 5 – 5 (RC)**

T.E. (Computer) (Semester – V) Examination, May/June 2014
DATABASE MANAGEMENT SYSTEMS (RC)

Duration : 3 Hours Total Marks : 100

Instruction : *Answer **any five** questions. choosing atleast **one** from **each** Module.*

MODULE – 1

1. a) Discuss the advantages and disadvantages of using a database system in a supermarket. How is it better than using a file system ? **6**

   b) Draw an ER diagram for the following data : **10**

   A General Hospital consists of a number of specialized wards (such as Maternity, Pediatric, Oncology, etc.). Each ward hosts a number of patients, who were admitted on the recommendation of their own General Physician (GP). On admission, the personal details of every patient are recorded. A separate register is to be held to store the information of the tests undertaken and the results of a prescribed treatment. A number of tests may be conducted for each patient. Each patient is assigned to one leading doctor. Doctors are specialists in some branch of medicine.

   c) What are multivalues attributes ? How can they be handled within the database design ? **4**

2. a) What is a query language ? Differentiate between procedural and non procedural query languages. **5**

   b) Define and explain the following terms with examples. **10**

      i) Cardinality

      ii) Weak Entity

      iii) Metadata

      iv) Aggregation

      v) Relationship.

   c) What are the main functions of a database administrator ? **5**

P.T.O.

MODULE – 2

3. a) Consider the following schema : **10**

Singers : SingerID, Name, Language

Songs : SongID, Title, Mood

Relationship : SongID, SingerID, Year

Answer the following using Relational Algebra :

i) Find names of all singers who have sung songs with a sad mood.

ii) Find names of singers who have sung songs with sad and romantic mood.

iii) Find names of all singers who have sung songs with sad or romantic mood.

iv) Find names of all singers who have sung only romantic songs.

v) Find names of all singers who have sung in Hindi and Konkani.

b) What is a View ? How is it defined in SQL ? Explain with an example. **4**

c) Construct the closure of the following set F of FD's for Relational Schema : **6**

R = {A, B, C, D E}

F = {A -> BC

CD -> E

B -> D

E -> A

}

List the candidate key for R.

4. a) Consider the following database : **12**

Employee (person_name, street,city)

Works (person_name, company_name, salary)

Company (company_name, city)

Manager (person_name, manager_name)

Write SQL statements for the following :

i) Write DDL statements for the above tables.

ii) Find names of employees who earn less than every employee of the company 'TECHSYSTEMS'.

iii) Find cities of employees whose names begin with the letter 'M'.

iv) Display names and cities of all managers.

v) Find names and cities of employees who work for the company 'Marino'.

b) Define a Foreign Key. What is it used for ? 3

c) Explain multivalued dependency with the help of an example. 5

MODULE – 3

5. a) List and explain the various steps in query processing. 10

b) Explain the process of heuristic optimization of query trees with the help of examples. 6

c) What is the need to normalize tables ? 4

6. a) What do you mean by BCNF ? How is it different from the 4th Normal Form ? 5

b) Explain the steps to convert a query tree into a query execution plan. 8

c) Explain the process of normalization upto the 3rd Normal Form with an example. 7

MODULE – 4

7. a) List and explain three different concepts on which Aries recovery algorithm is based on. 10

b) Differentiate between exclusive lock and shared lock. 5

c) In the context of concurrent access, describe the following terms : 5

i) Transaction

ii) Commit.

8. a) Why is concurrent control needed ? Explain different techniques of concurrency control . 10

b) Discuss the concept of serializability. 5

c) What are checkpoints ? Explain with examples. Why are they important ? 5