T.E. (Comp./IT) (Semester – I) Examination, 2010
DATABASE MANAGEMENT SYSTEMS
(2003 Course)

Time : 3 Hours
Max. Marks : 100

Instructions : *1) Answers to the **two** Sections should be written in **separate***
books.
*2) **Neat** diagrams must be drawn **wherever** necessary.*
*3) **Black** figures to the **right** indicate **full** marks.*
*4) Assume suitable data, **if necessary**.*

SECTION – I

1. a) A travel agency maintains various taxis. The list of drivers and their licence
number is also maintained by them. A log book maintains details about tours
that might have taken place along with date, location and drivers name and
other details. **6**

   i) Construct E-R model

   ii) Convert E-R into relational model, identify key attributes.

   b) What are the functional components of DBMS ? Explain with neat sketch. **8**

   c) Explain the distinction between condition-defined and user-defined design
constraints. Which of these contraints can the system check automatically ?
Explain. **4**

OR

2. a) Explain Specilization, generalization and aggregation with example. **6**

   b) Discuss the entity integrity and referential integrity constraits. **8**

   c) Explain different functions of DBA. **4**

3. a) Consider the relational database **8**

   dept(dept_no, name, location)

   employee(emp_no, emp_name, design, dept_no, proj_no)

   project(proj_no, proj_name, status)

   dept and employees are related as one to many.

   project and employees are related as one to many.

P.T.O.

Write relational algebraic expressions or SQL query for the following :

   i) List all the employees of 'inventory' department of 'Mumbai' location.

   ii) Give the names of employees who are working on 'blood bank' project.

   iii) Give the names of manager from 'marketing' dept.

   iv) Give all the employees working under 'incomplete' projects.

  b) Describe the circumstances in which you would choose to use embedded SQL rather than using SQL alone or using only a general purpose programming language ? List various embedded commands.   **8**

OR

4. a) Consider the relational database   **8**

   Supplier(sid, sname, address)

   Parts(pid, pname, color)

   Catalog(sid, pid, cost)

   Write relational algebraic expression or SQL queries for the following :

   i) Find names of suppliers who supply some red parts.

   ii) Find names of all parts whose cost is more than Rs. 25

   iii) Find name of all parts whose color is green.

   iv) Find name of supplier and parts with its color and cost.

  b) Describe the concept of cursor and how it is used in embedded SQL. Explain various commands in embedded SQL.   **8**

5. a) Consider R(A, B, C, D, E) with F defined as
$A \rightarrow B, CD \rightarrow E, A \rightarrow C, B \rightarrow D, E \rightarrow A$. Compute the closure of attributes set AD. (Hint : compute AD+).   **8**

  b) Give an example of relation schema R and a set of dependencies such that R is in BCNF, but not in 4 NF.   **8**

OR

6. a) Rewrite the definitions of 4 NF and BCNF using the notions of domain constraints and general constraints.   **6**

  b) Which are different fact finding techniques ? State advantages and disadvantages of each.   **10**

SECTION – II

7. a) What is index ? How it is used to speed up database retrieval ? Explain different types of index. **8**

b) Explain insertion operation on B+ trees with suitable example. **8**

OR

8. a) Differentiate between static and dynamic hashing. **8**

b) Discuss the techniques for allowing a hash file to expand and shrink dynamically. What are the advantages and disadvantages of each ? **8**

9. a) What is concurrency control ? Explain timestamp bases protocol. Compare the deferred and immediate versions of the log based cost. **8**

b) Illustrate difference between conflict serializable schedule and view serializable schedule by an appropriate example. **8**

OR

10. a) Show that two phase locking protocol ensures conflict serializability. **8**

b) When do deadlocks happen, how to prevent them, how to recover if deadlock takes place ? **8**

11. a) Specify advantages and disadvantages of distributed system. **9**

b) Discuss how persistence is specified in the ODMG object model in C++ binding. **9**

OR

12. a) Explain in detail ODMG language constructs for object definition and object manipulation. **9**

b) What is the difference between persistence and transient objects ? How is persistence handled in the typical object oriented database systems ? **9**