CS-15

MCA (III Year)

Term-End Examination

June, 2007

CS-15 : RELATIONAL DATABASE MANAGEMENT SYSTEM

Time : 3 hours *Maximum Marks : 75*

Note : *Question number 1 is* ***compulsory****. Answer any* ***three*** *questions from the rest.*

1. (a) In an organization several projects are undertaken. Each project can employ one or more employees. Each employee can work on one or more projects. Each project is undertaken on the request of a client. A client can request for several projects. Each project has only one client. A project can use a number of items and an item may be used by several projects. Draw an ER-diagram and convert it into a Relational Schema. *8*

(b) Describe the multiversion technique for Concurrency Control. *7*

(c) How is the checkpointing information used in the recovery operation following a system crash ? *7*

(d) Describe two phase commit protocol in distributed databases. *8*

2. (a) (i) The following relations are used to store data about students, courses and enrolment of students in courses and teachers of courses. (Primary key in each relation is marked by *)

Students (rollno*, sname, saddr)

Enrol (rollno, cno*, grade)

Teach (tno*, tname, cno*)

Write Create Table statements for defining the above tables.

Further write SQL statements to get rollno and names of students who have got an 'A' grade in a course taught by "Rohan". *9*

(ii) What is QBE ? *3*

(b) Why are certain functional dependencies called "trivial functional dependencies" ? Explain. *3*

3. (a) Consider the following relations :

ITEM (I#, INAME)

ORDER (O#, ONAME, CNAME)

ORDERITEM (I#, O#)

Write the relational algebra queries for the following :

(i) Get the details of items ordered by the customer "Sohan".

(ii) Get the Item Nos. of items which are included in all orders. *6*

(b) Discuss "Wait-die" and "Wound-wait" approaches of deadlock avoidance. Compare these approaches of deadlock avoidance with a deadlock avoidance approach in which data items are locked in a particular order (according to their rank). *9*

4. (a) What are the relative advantages and disadvantages of Record-level logging, Page level logging and Query language logging ? *9*

(b) Describe normalization using join dependency, with the help of an example. *6*

5. Explain the following terms : *15*

(i) Physical data independence

(ii) Sequential data retrieval in hierarchical model

(iii) Content dependent access control

(iv) Distributed locking

(v) Domain integrity