T.E (I.T) sem VI (R) 22/5/2012

Con. 3782-12. Database Technologies GN–7337

(3 Hours) [Total Marks : 100

N.B. (1) Question No. **1 is compulsory.**
(2) Answer any **four** out of remaining questions.
(3) Assume any **suitable** data if **necessary** and clearly state it.

1. a) Explain Object Identity and Type Constructors. [05]
   b) Explain the term Data Transparency. [05]
   c) Explain two phase commit protocol. [05]
   d) Differentiate between Data warehouse and Data base system. [05]

2. 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, the positions they played in that game, and the result of the game.
   i) Design an EER schema, stating any assumptions you make. [07]
   ii) Show mapping of EER schema to relational schema. [05]

   b) What are multidimensional databases? How do these store data? [08]

3. a) Suppose a company would like to design a data warehouse to facilitate the analysis of moving vehicles in an online analytical processing manner. The company registers huge amounts of auto movement data in the format of (*Auto ID, location, speed, time*). Each *Auto ID* represents a vehicle associated with information, such as *vehicle category, driver category*, etc., and each location may be associated with a street in a city. Assume that a street map is available for the city.
   Design a data warehouse to facilitate effective online analytical processing and Write DMQL for above schema. [10]
   b) Explain with proper example nested relation in ORDBMS. [10]
4. a) Explain in details the major steps in the ETL process. [10]
   b) Explain design and implementation issues in Mobile databases. [10]

5. a) Consider the following global schema:
   BOOKS (Book#, Primary_author, Topic, Total_stock, $price)
   BOOKSTORE (Store#, City, State, Zip, Inventory_value)
   STOCK (Store#, Book#, Qty)
   i) Give an example of two simple predicates that would be meaningful for the BOOKSTORE relation for horizontal partitioning.
   ii) How would a horizontal derived partitioning of STOCK be defined based on the partioning of BOOKSTORE.
   iii) Show predicates by which BOOKS may be horizontally partitioned by topic.
   iv) Show how the. STOCK may be further partitioned from the partitions in (ii) by adding the predicates in (iii). [10]
   b) What are the main architectures used for building parallel databases? Give advantages & disadvantages of each. [10]

6. a) Explain in brief the architecture of data warehouse. [10]
   b) Consider relation R (PQRSTU) with following functional dependencies.
      $P \rightarrow Q$
      $ST \rightarrow PR$
      $S \rightarrow U$
      State R is in which normal form? Decompose it to BCNF. [10]

7. Write short note on [20]
   a) Referential integrity.
   b) Authorization in SQL.
   c) Spatial Databases.
   d) Temporal Databases.