END SEMESTER EXAMINATION   *MAY-2012*

CO/SW-211 DATABASE MANAGEMENT SYSTEM

Time: 3:00 Hours   *Max. Marks : 70*

> **Note :**   Question No. **ONE** is compulsory.
> Answer any **FOUR** questions from remaining.
> Assume suitable missing data, if any.

1 [a] What are the responsibilities of DBA and database designers?
  [b] Write a code of PL/SQL block to find the largest of three given numbers.
  [c] How is BCNF different from 3NF?
  [d] Write the algorithm steps to determine X^+, the closure of X under F.
  [e] Differentiate between primary and secondary storage.
  [f] Explain dirty read problem with example.
  [g] Explain the concept of starvation.   7x2=14

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 game. Design an ER schema diagram for
       this applications stating any assumptions you make, choose your
       favorite sport.   14

3 [a] Consider the following relations for a database that keeps track of
       business trips of sales persons in a sales office:
       SALES PERSON (SSN, Name, Start-Year, Dept-No)
       TRIP   (SSN,   From_city,   To_City,   Departure,   Date,
       Return-Date, Trip-ID)
       EXPENSE (Trip-ID, Account #, Amount)
       Specify the following queries in relational algebra:
  (i) Give the details (all attributes of TRIP relation) for trips that exceeded
       $ 2000 in expenses.

(ii) Print the SSN of sales man who took trips to 'America'.

(iii) Print the total trip expenses incurred by the salesman with SSN = '237-66-1234'.   7

[b] What is functional dependency? Explain the inference rules for functional dependency.   7

4[a] Explain ACID properties of transaction. Also draw the state transition diagram illustrating the states for transaction execution.   7

[b] Explain the concept of serializability of schedules.   7

5[a] Discuss the time stamp ordering protocol for concurrency control. How does strict timestamp ordering differ from basic timestamp ordering?   7

[b] Discuss the various database languages and interfaces.   7

6   Write short notes (*any two*):

[a] Hashing Techniques

[b] Buffer Management

[c] Indexing $7 \times 2 = 14$

7[a] You are given the below functional dependencies for relation R (A,B,C,D,E)

$F = \{AB \rightarrow C, AB \rightarrow D, D \rightarrow A, BC \rightarrow D, BC \rightarrow E\}$

(i) Is this relation is in BCNF? If not, show all dependencies that violate it.

(ii) Is this relation is in 3NF? If not, show all dependencies that violate it.   7

[b] Compute the closure $\{A\}^+$ of relation schema

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

$A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A.$ 7