MCA (Revised)

Term-End Examination

December, 2013

MCS-023 : INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

Time : 3 hours *Maximum Marks : 100*
 (Weightage 75%)

Note : *Question No. 1 is **compulsory**. Attempt any three questions from the rest.*

1. (a) Consider the following relations : 2.5x4=10
 hotel (<u>hotel no</u>, hotel name, city)
 room (<u>room no</u>, hotel no, type, price)
 booking (<u>hotel no</u>, <u>guest no</u>, date from, date to, <u>room no</u>)
 guest (<u>guest no</u>, g name, g address)
 Write appropriate Queries in SQL as well as in relational algebra, for the following :
 (i) Find the average price of a room
 (ii) List the names and address of all guests with bookings for a hotel in London, alphabetically ordered by name.
 (iii) Find the total income from all the rooms of the hotels in New York
 (iv) List the name(s) of guest(s) at the Winner. Hotel, who are paying highest price for a room.

(b) Differentiate between BCNF and 3NF. Why   **7**
     BCNF is considered as a stronger form of
     3NF ?

(c) Briefly discuss the concept of catalogs in   **8**
     distributed databases. How catalogs are
     used to maintain the consistency of
     database in an distributed environment.
     Use suitable example to justify your answer.

(d) Design an ER diagram for keeping track of   **8**
     the details of your favourite sports team.
     You should stone the matches played, the
     score in each match and individual player
     statistics for each match. Identify the
     entities, relationships and also mention the
     cardinality of ER diagram.

(e) List all the functional dependencies satisfied   **7**
     by the relational instance given below :

A	B	C
a_1	b_1	c_1
a_1	b_1	c_2
a_1	b_1	c_1
a_2	b_1	c_3

2. (a) Draw block diagram of ANSI SPARC 3   **8**
         Level architecture. Mention following in the
         diagram :

(i)   Languages used at each level.

(ii)   Data independence types, between different levels.

(iii)   SQL commands, associated with the languages used at each level.

(b) How serial schedule is different from serializable schedule ? What are the problems associated with both schedules ? How you will identify that a schedule is serializable ornot, use suitable example, in support of your answer.   **7**

(c) What are the additional functions does a distributed DBMS have over centralized DBMS ?   **5**

3. (a) Describe the shadow paging recovery technique. Under what circumstances does it not require a log ?   **5**

(b) What is a view in SQL ? How is it defined ? Discuss the problems that may arise when one attempts to update a view.   **7**

(c) What is the difference between centralized and client-server architectures ? How relational DBMS is evolved from the centralized architecture to the client server architecture ? What for ODBC is used in this context ?   **8**

4. (a) Discuss the differences between serial, **8** hashed and indexed sequential file organizations. Compare their storage and access efficiencies.

(b) What is optimistic scheduling ? Explain the **5** three phases of optimistic scheduling.

(c) Why do we normalize a database ? Write **7** statement of 2NF. Briefly discuss the insert, delete and update anomalies, if the relation is not in 2NF.

5. (a) Write short notes on following (*Any two*) **7**

(i) 2 - Phase locking

(ii) 2 - Phase commit

(iii) Time stamping

(b) What do you mean by the term **8** "TRANSACTION" in DBMS ? Briefly discuss the properties of transaction ? Violation of which property leads to which problem, when transactors are executed in an concurrent environment.

(c) What is a check point ? How is the check **5** point information used in recovery operation, following a system crash ?