MCS-043

MCA (Revised)
Term-End Examination
June, 2012
MCS-043 : ADVANCED DATABASE DESIGN

01747

Time : 3 hours   Maximum Marks : 100

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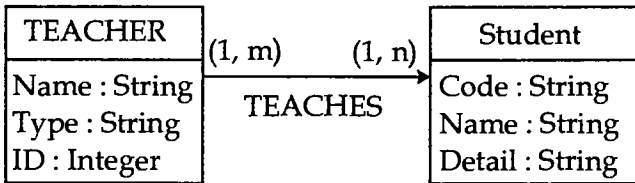
Answer **any three** questions from the rest.

1. (a)   Is the following XML document well   3
formed ? Justify your answer :

<?xml version = "1.0" standalone = "yes" ?>

<employee>

    <name>Amita</name>

    <department>English</department>

</employee>

<employee>

    <name>Sumita</name>

    <department>Hindi</department>

</employee>

   (b)   Determine all 4NF violations for the relation   6
schema R (X, Y, Z, W) with multivalued
dependencies $X \twoheadrightarrow Y$ and $X \twoheadrightarrow Z$.
Decompose the relation in to 4 NF.

(c) What are triggers ? Explain the significance of triggers with the help of an example in SQL. **5**

(d) What is Data Warehousing ? Discuss various characteristics of Data Warehousing. **5**

(e) Create an object oriented database (using ODL) for the following class diagram, **5**

TEACHER	(1, m) (1, n)	Student
Name : String Type : String ID : Integer	TEACHES	Code : String Name : String Detail : String

(f) Explain with the help of an example, the log based recovery scheme, using deferred database modification approach. **5**

(g) Explain the role of query optimiser in oracle. **5**

(h) Why do you need 3 Phase Commit (3PC) Protocol in case of distributed Databases ? Explain the 3PC protocol with the help of a diagram. **6**

2. (a) What is multilevel security ? What are typical security levels ? **6**

(b) How database Queries differ from data mining Queries ? Explain the K-means clustering in data mining algorithm with the help of an example. **7**

(c) Consider the following Query 7
Select student_id, student_name, subject, marks
From STUDENT, RESULT
Where STUDENT. student_id = RESULT. Student_id
And RESULT. marks > 60
Create a Query evaluation plan for the above Query, assume suitable relations and statistics.

3. (a) What are multimedia databases ? Discuss 6 the challenges in designing the multimedia databases.

(b) "2 Phase locking protocol uses waiting, 6 where as time stamping method uses Roll back of Transaction, to avoid non serializable execution". By considering the same transaction schedule, compare the above two execution strategies for concurrent transactions.

(c) Consider the following relations : 8
    student (id, name, age, programme)
    (fee-paid(id, date, amount)
    (i) Create a view using SQL for a student whose id is "001". The student is allowed to see information about himself/herself.
    (ii) The student has only read-access to his/her data. Write the appropriate SQL code for the above.

(iii) Create another view for Administrator who can access and modify all the data.

4. (a) Consider a supply data of an organization having three dimensions as SUPPLIER, PART and PROJECT where a supplier "s" supplies part "p" to project "r" in quantity "q". Draw a star schema with SUPPLY as fact table. Make suitable assumptions. How does star schema differs from snow flake schema ? **8**

(b) With the help of a diagram, explain the reference architecture of Distributed DBMS. **6**

(c) List the characteristics and challenges in implementation of mobile databases. **6**

5. (a) What are the different type of index implementations available in POST gre SQL ? Explain each one of them. **6**

(b) Explain the following : **8**
(i) Dynamic SQL
(ii) OLAP and its types
(iii) Spatial databases
(iv) Semantic databases

(c) What is the significance of creating Data Dictionary in DBMS ? Explain the statistics stored in the Data Dictionary, with the help of an example. **6**