MCS-043

MCA (Revised)

Term-End Examination

December, 2007

MCS-043 : ADVANCED DATABASE DESIGN

Time : 3 hours *Maximum Marks : 100*

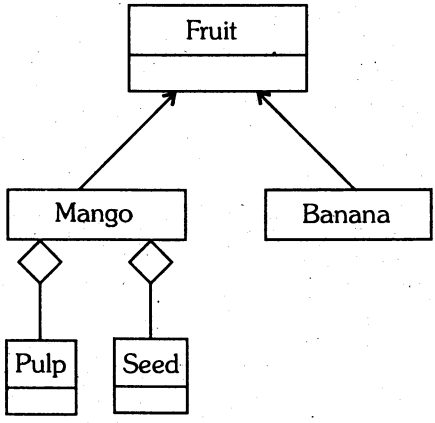
Note : *Question number 1 is* ***compulsory****. Answer any* ***three*** *questions from the rest.*

1. (a) Why is the functional dependency called so ? Consider the following functional dependency :

if you study → you will pass

Create instances where this functional dependency will hold/not hold. *12*

(b) Create and explain an object oriented database for the following UML diagram. Assume your attributes and functions. 8



(c) Consider the following table : 10

Employee_name	Project_name	Dependent_name
Mohan	X	Shyam
Mohan	Y	Ram
Mohan	X	Ram
Mohan	Y	Shyam

Identify the multivalued dependencies in the above table and write an SQL code to check whether the table satisfies the multivalued dependency identified by you.

(d) Explain the Apriori algorithm for finding frequent itemsets using an example. 10

2. (a) What are assertions ? What is the syntax for declaration of an assertion ? Also, give an example of assertion. *10*

(b) Explain any two examples of vendor-specific security. *10*

3. (a) Given the relational schemas :

ENROLL (S#, C#, Section) S# represents student number.

TEACH (Prof, C#, Section) C# represents course number

ADVISE (Prof, S#) Prof is a thesis advisor of S#

GRADES (S#, C#, Grade, Year)

STUDENT (S#, Sname) Sname is a student name

Write queries expressed in relational algebra.

(i) List all students taking courses with Mohan or Shyam.

(ii) List all students taking at least one course that their advisor teaches.

(iii) List those professors who teach more than one section of the same course. *12*

(b) Explain the architecture of a Data warehouse with the help of a figure. *8*

4. (a) Explain the tasks in the KDD process with the help of a figure. *10*

(b) Explain the architecture of Oracle 10g with the help of a figure. *10*

5. (a) Consider the universal relation

R = {A, B, C, D, E, F, G, H, I, J} and a set of functional dependencies.

$$F = \begin{Bmatrix} AB \rightarrow C \\ A \rightarrow DE \\ F \rightarrow GH \\ D \rightarrow IJ \end{Bmatrix}$$

Decompose R into BCNF. *10*

(b) Explain the component architecture of DDBMS with the help of a figure. *10*