*Name* : .....

*Roll No.* : .....

*Invigilator's Signature* : .....

**CS/BCA/SEM-4/BCA-401/2013**

**2013**

# DATABASE MANAGEMENT SYSTEM

*Time Allotted* : 3 Hours *Full Marks* : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

## GROUP – A

## ( Multiple Choice Type Questions )

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) Which of the following keyword is used in SQL to eliminate duplicate rows from the query result ?

a) NO DUPLICATE b) DISTINCT

c) UNIQUE d) none of these.

ii) Relational algebra is a ..... language.

a) non-procedural b) procedural

c) programming d) none of these.

iii) The ..... command returns the number of rows deleted.

a) Truncate b) Delete

c) Drop d) none of these.

iv) Which of the following clauses is used to enforce a condition on a SQL statement containing "group by" caluse ?

a) Where b) Having

c) Order by d) None of these.

v) Generalization is a ..... approach.

a) bottom up b) top down

c) both (a) & (b) d) none of these.

vi) Functional dependency is the dependency between

a) Tuples b) Attributes

c) Values d) None of these.

vii) COMMIT is a ..... statement.

a) TCL b) DCL

c) DML d) DQL.

viii) Which of the following is not an aggregate function ?

a) SUM b) MIN

c) MAX d) DISTINCT.

ix) Files of unordered records are called

a) heap files b) sorted files

c) hash files d) none of these.

x) The main goal of indexing is to

a) search an item faster from a table

b) insert an item faster into a table

c) delete an item faster from a table

d) none of these.

xi) The degree of a relationship describes

a) the number of attributes attached to a relation

b) the number of entities attached to a relation

c) the number of relations used to connect the entities

d) none of these.

xii) The full form of CODASYL is

a) Correlated Data System Language

b) Conference on Data System Language

c) Cohesion of Data Systems Language

d) None of these.

## GROUP – B
## ( Short Answer Type Questions )

Answer any *three* of the following. $3 \times 5 = 15$

2. Differentiate between the following : $2\frac{1}{2} + 2\frac{1}{2}$

a) Delete and Truncate operations.

b) Referential integrity and entity integrity.

3. $R$ ( $A, B, C, D, E$ ) and $A \rightarrow BC$, $B \rightarrow E$, $CE \rightarrow D$ in $R$. Find the candidate key for $R$.

4. What do you mean by degree of a relationship ? What is cardinality of a relationship ? What is a ternary relationship ? 1 + 1 + 2 + 1

5. Explain the disadvantages of file oriented approach.

6. "Minimal super key is candidate key". With a suitable example, justify the statement.

## GROUP – C
## ( Long Answer Type Questions )

Answer any *three* of the following. 3 × 15 = 45

7. What do you mean by fully functional dependency ? A relation $R$ ( $A, B, C$ ) having FDs — $A \rightarrow B$, $A \rightarrow C$, $C \rightarrow B$. Is the relation in 2NF ? Can it be decomposed to 3NF ? Justify your answer. 5 + 10

8. Consider a relation —

   Bank ( Customer_name, account_no, account_type, balance, branch )

   Solve the following queries using SQL, Relational Algebra and Tuple Relational Calculus. 5 × 3

   i) Retrieve total balance amount for individual branch.

ii) Retrieve the name of the customers who have an account in "Dunlop" branch and balance less than Rs. 10,000.

iii) List the information of all customers of savings branch.

iv) Who have the minimum balance among all customers ?

v) Display the balance of thsoe customers whose balance starts with the letter '*A*'.

9. Consider the universal relation :

$R = \{ A, B, C, D, E, F, G, H, I, J \}$ and the set of functional dependencies :

$AB \rightarrow C$

$A \rightarrow DE$

$B \rightarrow F$

$F \rightarrow GH$

$D \rightarrow IJ$

For the above relation $R$ and functional dependencies, consider the decomposition $D = \{ R1, R2, R3 \}$ where

$R1 = \{ A, B, C, D, E \}$

$R2 = \{ B, F, G, H \}$

$R3 = \{ D, I, J \}$

Find out whether this decomposition is lossless or lossy.

10. Differentiate between various levels of data abstraction. What is data independence ? Explain the difference between physical and logical data independence. List any two significant differences between a file processing system and a DBMS. 5 + 2 + 4 + 4

11. Difference between the following : 10 + 5

    a) Theta Join

    b) Equi Join

    c) Natural Join

    d) Outer Join

    Define the five basic operators of relational algebra with an example each.