

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 × 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" clause ?

- 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.

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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.



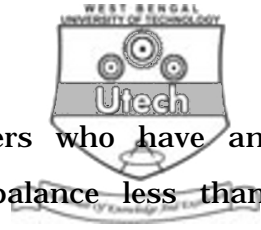
3.  $R ( A, B, C, D, E )$  and  $A \rightarrow BC, B \rightarrow E, CE \rightarrow D$  in  $R$ . Find the candidate key for  $R$ .
4. What do you mean by degree of a relationship ? What is cardinality of a relationship ? What is a ternary relationship ? 1 + 1 + 2 + 1
5. Explain the disadvantages of file 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 those 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.

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