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BICS-038

DIPLOMA – VIEP – COMPUTER SCIENCE AND ENGINEERING (DCSVI)

Term-End Examination

00523

December, 2016

BICS-038 : DATABASE MANAGEMENT SYSTEM

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all. Question no. **1** is **compulsory**. Each question carries equal marks.*

1. Choose the correct answer from the given four alternatives : *7×2=14*

(a) Foreign key cannot be null, relates to

(i) Entity Integrity Constraint

(ii) Referential Integrity Constraint

(iii) Domain Integrity Constraint

(iv) None of the above

(b) DDL stands for

(i) Data Definition Language

(ii) Data Description Language

(iii) Data Decomposition Language

(iv) Data Derivation Language

(c) SQL commands INSERT, DELETE, UPDATE, come under the purview of

(i) DDL

(ii) DML

(iii) DCL

(iv) None of the above

(d) Issues related to partial functional dependency are resolved in _____ normal form.

(i) First

(ii) Second

(iii) Third

(iv) None of the above

(e) _____ protocol relates to concurrency management.

(i) 2-Phase Locking

(ii) 2-Phase Commit

(iii) Both (i) and (ii)

(iv) None of the above

(f) Nouns identify _____ of ER Diagrams.

(i) Entities

(ii) Relations

(iii) Attributes

(iv) None of the above

(g) _____ is the minimal super key.

(i) Primary key

(ii) Secondary key

(iii) Foreign key

(iv) Composite key

2. Explain the following with the help of suitable examples :

(a) Third Normal Form (3NF)

(b) Boyce-Codd Normal Form (BCNF)

Also prove that "BCNF is stronger than 3NF". *5+5+4=14*

3. (a) Draw an ER Diagram for the following statement :

"Teachers teach students in an institute affiliated to a University."

Choose proper set of attributes for each component in the diagram. Prepare the database for each component, as per the identified schema. *7*

(b) Differentiate between the following : *7*

(i) 2-Phase Commit and 2-Phase Locking

(ii) File Base System and Database Management System

4. (a) Perform the following operations on the relations R_1 and R_2 given below : *4×2=8*

R_1 :

A	B
A_1	B_1
A_2	B_2
A_3	B_3
A_4	B_4

R_2 :

A	B
A_1	B_1
A_7	B_7
A_2	B_2
A_4	B_4

(i) $R_1 \cup R_2$

(ii) $R_1 \cap R_2$

(iii) $R_1 \times R_2$

(iv) $R_1 \bowtie R_2$

(b) Discuss the concept of "view" in databases. What are the advantages of "view" ? Can we perform insert, delete or modify operations, if the view contains a group function ? Justify your answer with suitable arguments. *6*

5. (a) Write short notes on any ***two*** of the following : $2 \times 3\frac{1}{2} = 7$

(i) Wait-die Protocol

(ii) Wait-wound Protocol

(iii) Optimistic Scheduling

(b) What are triggers in DBMS ? Discuss the role of triggers in DBMS. List the constraints imposed on SQL triggers. *2+3+2=7*

6. Differentiate between the following : *7+7=14*

   (a) Hash based Indexing and Tree based Indexing

   (b) Cluster Indexes, Primary and Secondary Indexes

7. Discuss the role of ACID properties for managing the transactions in concurrent environment. Violation of which property relates to "Lost update problem" ? Discuss the "Lost update problem" with a suitable example. *8+2+4=14*

8. Draw the diagram of three-level architecture of a database. Discuss the role of each level, along with the languages and SQL commands operational at each level. How is the working of these three levels related to the concept of data independence ? *5+5+4=14*