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CSI-14

Bachelor in Information Technology (BIT)

00239

Term-End Examination

June, 2010

CSI-14 : DATA ANALYSIS AND DATABASE DESIGN

Time : 3 hours *Maximum Marks : 75*

Note : *There are **two** sections in this paper. All questions from **Section-A** are **compulsory**. Answer any **three** questions from **Section-B**. All multiple choice questions carry **one** mark each.*

SECTION - A

1. Which level of data abstraction describes, how the data is stored ? **15x1=15**

(a) Physical (b) Conceptual

(c) Storage (d) File level

2. The number of entities to which another entity can be associated via a relationship set is expressed as _____.

(a) Schema (b) Attributes

(c) Tuple (d) Cardinality

3. Data about data is normally termed as :

(a) Data dictionary (b) Meta Data

(c) Data base (d) Tuple

4. The statement requesting the retrieval of information is normally in the form of _____.

(a) Query
(b) Record
(c) Data entry screen
(d) Report

5. If A1, A2, ... An are domains in a relational model then the relation is a table which is a subset of _____.

(a) {A1, A2 ..... An}
(b) A1 × A2 × ..... An
(c) A1 ∪ A2 ∪ ..... An
(d) Min { A1, A2 ..... An}

6. Data independence concept is similar to the concept of :

(a) Polymorphism (b) Inheritance
(c) Abstract Data Type (d) Consolidation

7. Every BCNF is in _____.

(a) 4 NF. (b) 5 NF.
(c) 3 NF. (d) All of the above.

8. Functional dependencies are a generalisation of _____.

(a) Relational dependencies.
(b) Database dependencies.
(c) Key dependencies.
(d) None of the above.

9. What is the use of Roll back of transaction ?
   (a) Retrieve old records.
   (b) Restore records.
   (c) Transaction update.
   (d) Recover from the transaction failure.

10. Which of the following method should be used to parallel process a join of three or more relationships ?
   (a) Join Decomposition
   (b) Pipeline
   (c) Parallel Query
   (d) Merge Join

11. Which of the following technique ensures that the system will never enter a deadlock ?
   (a) Validation Protocol
   (b) BCNF
   (c) Deadlock Prevention Protocol
   (d) Time stamped transaction

12. The columns of a table are called _____ in relational data model.
   (a) Fields (b) Attributes
   (c) Entities (d) Records

13. In a relational Database, _____ are not allowed to have null values.
   (a) Join (b) Key
   (c) Field (d) All of the above

(b) What is the difference between Specialization and Generalization with respect to database ? Explain, with an example for each. 5

19. (a) What do you mean by transaction in a database ? What are the properties of transaction ? Explain. 5

(b) Write the advantages of BCNF over 3 NF. Give an example of a relational scheme that is in 3 NF but not in BCNF. 5

(c) What are the problems of concurrent transactions ? Explain using an example for each. 5

20. A relational database is to be created for recording the information about entities and relationships of Inventory Management System. It should contain the information about item-code, item-name, minimum quantity, quantity in stock, item-unit, item-cost, date of receipt, quantity receipt, item issued to, date of issue, quantity of issue, supplier code, supplier name, etc.

Note : Make necessary assumptions, if any

(a) Draw an ER diagram with all keys, attributes, entities and relationships. 6

(b) Derive tables from the ER diagram. 9

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14. SQL queries are based on _____ operation.

(a) Join (b) Selection

(c) Read (d) Where

15. Temporary relationships are created by using _____ Relation command.

(a) GET (b) SET

(c) PROJECTION (d) JOIN

16. Differentiate between each of the following : **5x3=15**

(a) Super key and candidate key

(b) Schema and Instance

(c) 4 NF and BCNF

(d) Logical and physical data Independence

(e) Where and Having clause in SQL.

SECTION - B

Answer ***any three*** questions from this section. Each question carries **15** marks :

17. Consider the following relations with primary keys underlined :

Employee (Emp-ID, Emp-Name, Designation)

Project (Project_No, Project_Name, Project_Manager, Project_Leader)

Assigend _To (Project_No, Emp-ID)

Make assumptions, if necessary.

(a) Write DDL statements for implemention of project database. Statements should clearly indicate the primary and Foreign keys. **6**

(b) Write the following queries in relational algebra SQL : **9**

(i) Get the details of employees working on the projects named PROJ 112 and PROJ 342.

(ii) List the name and designation of employees working on PROJ 342 but not on PROJ 112.

(iii) Delete the record of employees who are working on a project for which "EMP 3672" (emp-ID) is the Project_Manager.

18. (a) Explain the following Codd's commandments :

(i) Rules of referencial integrity **4**

(ii) Rule of entity integrity **3**

(iii) Comprehensive sublanguage rule **3**