BCA/3/CC/15   **Student's Copy**

Professional Course Examination (Odd), 2023

(3rd Semester)

BACHELOR OF COMPUTER APPLICATIONS

Course No. : BCA/3/CC/15

(Database Management Systems)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(PART : A—OBJECTIVE)

(*Marks* : 25)

SECTION—I

(*Marks* : 15)

I. Tick (✓) the correct answer in the brackets provided :   1×10=10

1. In the database approach, data is structured using tables that consist of

 (a) files and folders   (   )

 (b) rows and columns   (   )

 (c) linked list   (   )

 (d) array   (   )

2. What is the purpose of a primary key in a relational database?
   (a) Unique identifier for each tuple in a table ( )
   (b) It establishes a link between two or more tables ( )
   (c) It stores large binary data ( )
   (d) It creates a view from one table or more tables ( )

3. A _____ is a request made to the database to retrieve, manipulate, or modify data.
   (a) view ( )
   (b) query ( )
   (c) transaction ( )
   (d) instance ( )

4. Which normalization form is based on the condition that relation must not contain any partial dependency?
   (a) 1NF ( )
   (b) 2NF ( )
   (c) 3NF ( )
   (d) BCNF ( )

5. If relations $A = (1, 2, 3, 4, 5)$ and $B = (1, 3, 4, 6, 8)$, what will be the value of $Z = A \cap B$?
   (a) $Z = (1, 2, 3, 4, 5, 8)$ ( )
   (b) $Z = (1, 2, 3, 4, 5, 6, 8)$ ( )
   (c) $Z = (1, 3, 4)$ ( )
   (d) $Z = (1, 3, 4, 6, 8)$ ( )

6. In which relationship "A primary key is at 'one' side of the relationship, and the foreign key is in the 'many' side of the relationship"?
   (a) One-to-many ( )
   (b) One-to-one ( )
   (c) Many-to-many ( )
   (d) All of the above ( )

7. For performing tasks like creating the structure of the relations, deleting relation, which of the following is used?

   (a) Data definition language   (   )

   (b) Data manipulation language   (   )

   (c) Data control language   (   )

   (d) Dynamic definition language   (   )

8. Which type of cursor allows updates to the underlying data while iterating?

   (a) Read-only cursor   (   )

   (b) Forward-only cursor   (   )

   (c) Scroll cursor   (   )

   (d) Static cursor   (   )

9. Which term refers to the process of converting plain text into a scrambled form to protect sensitive data in a database?

   (a) Encryption   (   )

   (b) Normalization   (   )

   (c) Compression   (   )

   (d) Indexing   (   )

10. Which database backup type captures all changes made to the database since the last full or differential backup?

    (a) Full backup   (   )

    (b) Differential backup (   )

    (c) Incremental backup   (   )

    (d) Log backup   (   )

II. State whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark in the brackets provided :   1×5=5

1. In a one-to-one relationship, one instance of an entity is associated with exactly one instance of another entity and vice versa.

(T / F)

2. Tree data structure is used in hierarchical model.

(T / F)

3. The database definition or descriptive information stored by the DBMS in the form of a database catalog or dictionary is called meta-data.

(T / F)

4. In SQL, the DELETE statement is used to remove rows from a table, while the TRUNCATE statement is used to remove the entire table along with its data.

(T / F)

5. When we perform inner join, all those tuples returned which don't satisfy the given condition.

(T / F)

SECTION—II

(*Marks* : 10)

III. Answer the following questions :   2×5=10

1. *(a)* What is logical and physical data independence?

OR

(b) Explain network data model.

2. *(a)* Define entity integrity constraint.

OR

(b) What are entities and attributes?

3. (a) What are functional dependencies?

OR

(b) Write the role of Database Administrator (DBA).

4. (a) What are queries and sub-queries?

OR

(b) What are aggregate functions in SQL? Give example.

5. (a) Write the roles of GRANTING and REVOKING in database security.

OR

(b) What are the database privileges?

(PART : B—DESCRIPTIVE)

(*Marks* : 50)

IV. Answer the following questions :   10×5=50

1. (a) Describe the term 'Database Management System (DBMS)'. Briefly explain the relational model of DBMS and support your answer with advantages and disadvantages of using DBMS.   2+8=10

OR

(b) Define the term 'design constraints'. Explain the five types of constraints and support with appropriate examples.   2+8=10

2. (a) What is meant by the term Entity-Relation (ER) model? Explain the symbols and their meaning used in ER diagram.   2+8=10

OR

(b) Define the term Enhanced Entity Relationship (EER) model. Briefly explain generalization with an appropriate example.   2+8=10

3. *(a)* What is meant by data independence? Explain the types of data independence. 2+8=10

OR

(b) What is relational algebra? Explain the PROJECT operation in relational algebra with syntax and appropriate example. 2+8=10

4. *(a)* Explain the term Structured Query Language (SQL). Elaborate the types of SQL commands with an appropriate example. 2+8=10

OR

(b) What is meant by normalization in DBMS? Briefly explain the Boyce-Codd normalization form. 2+8=10

5. *(a)* Explain the dimensions of database security. Describe the three types of threats that can be posed on a database. 3+7=10

OR

(b) What are the actions a DBA can perform on individual accounts for Database Security? Write and explain various recovery facilities in DBMS. 2+8=10

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