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* *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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