BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – BCA-Hons-2023
Course Name – Database Management System
Course Code - BCA37107 (T)
(Semester III)

Full Marks : 40 **Time : 2:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 10=10

1. *Choose the correct alternative from the following :*

(i) The entity integrity constraint states that
   a) No primary key value can be null. b) A part of the key value can be null.
   c) Duplicate object values are allowed. d) None of these.

(ii) In a relational model, the number of columns of a table is called
   a) Relation. b) Tuple.
   c) Attribute. d) Degree.

(iii) The normal form in which every determinant is a key, is called
   a) 2NF. b) 3NF.
   c) BCNF. d) 4NF.

(iv) Let a relation R(ABCD) and the functional dependency FD={A->B}. The candidate key of R is
   a) {A}. b) {AB}.
   c) {ACD}. d) None of these.

(v) Which of the following act as 'all-or-none' property?
   a) Atomicity. b) Consistency.
   c) Durability. d) All the mentioned.

(vi) The SQL commands CREATE, ALTER, and DROP are classified as
   a) DDL. b) DML.
   c) DCL. d) TCL.

(vii) Attribute in an E-R diagram is represented by
   a) Rectangle. b) Square.
   c) Ellipse. d) Triangle.

(viii) A limitation of the flat file-based data model is
   a) High complexity in querying. b) Redundancy and inconsistency in data.
   c) Supports complex relationships. d) Difficult to implement.

(ix) The process of decomposition of a table is known as_____.
   a) Normalisation b) Specialisation
   c) Transaction d) None of these

(x) Which of the following statement is correct according to the following instance of the relational schema R(X, Y, Z) ?

X	Y	Z
1	1	a
1	1	a
2	1	b
3	2	b

a) X->Y, Z->X
b) X->Z, Z->X
c) X->Y, X->Z
d) Z->X, X->Z

Group-B
(Short Answer Type Questions) 3 x 5=15

2. Illustrate Insertion , Deletion and Updation anomalies with example. (3)
3. Explain Three layers of architecture of DBMS. (3)
4. Explain Theta join and Natural join operations with respect to relational algebra. (3)
5. Differentiate between Strong entity set and Weak entity set with a suitable example. (3)
6. Let two sets of functional dependencies are F={A->C, AC->D, E->AD, E->H} and G= {A->CD, E->AH} (3)
   Check whether they are equivalent. Justify your answer.

OR

Prove that any relation schema with two attributes is in BCNF. (3)

Group-C
(Long Answer Type Questions) 5 x 3=15

7. Consider the two transactions T1 and T2 such that (5)
   T1: R1 (A) W1 (A) R1 (B) W1 (B)
   T2: R2 (A) W2 (A) R2(C) W2(C)
   Leat a schedule S: R1 (A) W1 (A) R2 (A) W2 (A) R1 (B) W1 (B) R2 (C) W2 (C).
   Find out whether the given schedule is conflict serializable or not.
8. Explain the ACID properties with sutaible example. (5)
9. Let R(A,B,C,D,E) be a relation with FDs={A→C, B→C, C→D, DE→C, CB→A}. R is decomposed into R1(A,D), (5)
   R2(A,B), R3(B,E), R4(C,D,E), R5(A,E). Check whether it is lossy or lossless.

OR

Given a database schema named PLANE_INFO (flight_no, date, plane, airline, from, to, miles), where (5)
{flight_no, date} is the candidate key of PLANE_INFO. The FD diagram is given below: Decompose up to 3NF.