QUESTION 2015

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following:

i) Referential integrity is directly related to

a) relational key ✓b) foreign key c) primary key d) candidate key

ii) Which level of Abstraction describes how data are stored in the database?

✓a) Physical level b) View level c) Abstraction level d) Logical level

iii) Which of the following is true?

✓a) A relation in BCNF is always in 3NF
b) A relation in 3NF is always in BCNF
c) BCNF and 3NF are same
d) A relation in BCNF is not in 3NF

iv) Consider a schema $R(A, B, C, D)$ and functional dependencies $A \to B$ and $C \to D$. Then the decomposing $R_1(A, B)$ and $R_2(C, D)$ is

✓a) dependency preserving but not lossless join
b) dependency preserving and lossless join
c) lossless join but not dependency preserving
d) lossless join

v) To select a tuple from a relational database table, the symbol used in relational algebra is

a) ρ (Row) ✓b) σ (Sigma) c) Π (Project) d) none of these

vi) $R = (A, B, C, D)$, $F = (AB \to C, C \to D)$. Find candidate key

✓a) AB b) ABC c) $ABCD$ d) none of these

vii) Which is the SQL command to remove rows from a table?

a) REMOVE ✓b) DELETE c) TRUNCATE d) All of these

viii) The first phase of query processing is:

✓a) decomposition b) restructuring c) analysis d) none of these

ix) The distinguishable parts of a record are called:

a) Files b) Data ✓c) Fields d) Database

x) Normalization of database is needed to:

a) make data more intelligible to humans b) remove error in data entry

✓c) eliminate redundant data d) all of these

Group – B
(Short Answer Type Questions)

2. Compute the closure of the following set F of functional dependencies for relation schema:

$R=(A,B,C,D,E),\ F=\{A\to BC,\ CD\to E,\ B\to D,\ E\to A\}$

List the candidate keys for R

See Topic: FUNCTIONAL DEPENDENCIES AND NORMALIZATION, Long Answer Type Question No. 6.

3. Explain the query optimization technique with relevant examples.

See Topic: QUERY OPTIMIZATIOM, Long Answer Type Question No. 1.

4. What is lossless decomposition? Consider the relation $R_1(A,B,C)$ and $R_2(C,D)$. Show that this decomposition is dependency preserving or not.

1st part: See Topic: FUNCTIONAL DEPENDENCIES AND NORMALIZATION, Short Answer Type Question No. 9.

2nd part: Question is not clear.

5. How does BCNF differ from 3NF? Why is it considered stronger than 3NF?

See Topic: FUNCTIONAL DEPENDENCIES AND NORMALIZATION, Short Answer Type Question No. 14.

6. Discuss the different database anomalies.

See Topic: FUNCTIONAL DEPENDENCIES AND NORMALIZATION, Short Answer Type Question No. 15.

Group – C
(Long Answer Type Questions)

7. a) Consider the following schema:

Book(acc_no, yr_pub, title)

User(card_no, bname, baddress)

Borrow(acc_no, doi, card_no)

Where acc_no is account number, yr_pub is year of publication, bname is borrower name, baddress is borrower address, doi is date of issue.
Perform the following queries on the table.(In SQL)
(i) Find the account number whose year of publication is 1985.
(ii) Display the title of the book which has been borrowed by "Vijoy"
(iii) Find the borrower name who lives in same city as "Vijoy"
(iv) find the borrower name and address who should issue book on 14-05-1988
(v) Find the acc_no of Book whose year of publication is 1992 and title is "Compiler Design"
b) State Armstrong's Axioms.

a) See Topic: SQL, Long Answer Type Question No. 5.

b) See Topic: FUNCTIONAL DEPENDENCIES AND NORMALIZATION, Long Answer Type Question No. 1.

8. a) What is index? Define clustering indices, hash indices, dense indices and Primary-secondary index.
b) What is data abstraction?
c) Define the concept of aggregation, generalization, and specialization and attribute inheritance.

a) See Topic: STORAGE STRATEGIES, Long Answer Type Question No. 4.

b) See Topic: INTRODUCTION, Short Answer Type Question No. 12.

c) See Topic: INTRODUCTION, Short Answer Type Question No. 11.

9. What do you mean by Super key, Candidate key and Primary key? Take a single example of a database and explain the relationship between primary key, candidate key, foreign key in the same example.

See Topic: RELATIONAL MODEL, Long Answer Type Question No. 6.

10. a) Explain with two examples why the set $\{\sigma, \pi, \cup, \neg, X\}$ is called the complete set of relational algebra operation.
b) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number or recorded accidents. State all your assumptions.

a) See Topic: RELATIONAL MODEL, Long Answer Type Question No. 5.

b) See Topic: ENTITY-RELATIONSHIP MODEL, Long Answer Type Question No. 5.

11. Write short notes on any three of the following:
a) Role of DBA in database design.
b) Three-level architecture of DBMS.
c) Query language
d) B+ tree
e) Logical and physical data independence.

a) See Topic: INTRODUCTION, Long Answer Type Question No. 6(c).

b) See Topic: INTRODUCTION, Long Answer Type Question No. 6(e).

c) See Topic: SQL, Long Answer Type Question No. 8.
d) See Topic: STORAGE STRATEGIES, Long Answer Type Question No. 5(d).
e) See Topic: INTRODUCTION, Long Answer Type Question No. 6(d).