

- Q.4 Define first, second and third normal forms. Consider the universal relation  $R = \{A, B, C, D, E, F, G, H, I, J\}$  and the set of functional dependencies  $F = \{\{A, B\} \rightarrow \{C\}, \{A\} \rightarrow \{D, E\}, \{B\} \rightarrow \{F\}, \{F\} \rightarrow \{G, H\}, \{D\} \rightarrow \{I, J\}\}$ . What is the key for R? Decompose R into 2NF then 3NF relations.

**OR**

Define join dependencies and multi valued dependencies. Explain fourth and fifth normal forms with example.

- Q.5 Write the SQL statements to perform the following operations

- Create a table Book (acc\_no, title, author, catalog)
- Add 3 records with proper entries
- Delete a record with accno number as 3.
- Delete rest of the records
- Add a column publisher into the table
- Insert one record

**OR**

Write SQL statements to create the following table and execute the given queries.

- depositor (customername, acc\_num)
  - borrower (custnm, loan\_num)
  - branch {br\_name, br\_city, assets)
  - account (br\_nm, accno, balance)
  - loan {brnm, loan\_no, amount)
- Retrieve all the customer names who have an account at all the branches located in Brooklyn.
  - Find all the branch names having assets greater than at least one branch in Brooklyn.
  - Retrieve the customer(s) who own largest account balance in the Bank.

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**Code No. : B-414(A)**

**Annual Examination - 2017**

**BCA-II**

**BCA-202**

**DBMS (ORACLE & SQL)**

**Max.Marks : 100**

**Min Marks : 40**

**Time : 3 Hrs.**

Note: Section 'A' is very short answer type, containing 10 questions, is compulsory. Section 'B' consists of short answer type questions and Section 'C' consists of long answer type questions. Section 'A' has to be solved first.

**Section-'A'**

**Very short answer type questions. Answer in one or two sentences. (2x10=20)**

- What is DDL? Give an example of one DDL statement in SQL.
- Name any two commercial DBMS packages.
- What does the cardinality ratio specify?
- What is an alternate key? Explain with an example.
- Define Entity Integrity constraint.
- What are aggregate functions?
- What is meant by normalization of data?
- Define multi valued dependency.
- Write the syntax of drop command.
- What is a cursor?

**Section-'B'**

**Short answer type questions with word limit 150-200 (6x5=30)**

- What do you mean by a DBMS? Explain the basic architecture of a DBMS. List any five examples of commercial DBMS packages.

**OR**

Explain the term data independence with an example.

**P.T.O.**

Q.2 Explain the following terms in the context of ER data model: Entity, Attribute, Specialization and Cardinality

OR

How the concept of a weak entity is useful in data modeling. Explain with an example.

Q.3 Differentiate between set membership and set comparison operators in SQL.

OR

Write the syntax of insert, delete and update commands of relational algebra.

Q.4 What is second normal form? Suppose that we decompose the schema  $R=(A,B,C,D,E)$  into  $(A,B,C)$  and  $(A,D,E)$ . Show this decomposition is a loss less join decomposition if the following set F of fundamental dependencies holds  $A \rightarrow BC$ ;  $CD \rightarrow E$ ;  $B \rightarrow d$ ;  $E \rightarrow A$

OR

Explain with an example :

- 1. Lossless decomposition
- 2. Functional dependency
- 3. Multivalued dependency
- 4. Join dependency.

Q.5 When do you use WHERE clause and when do you use HAVING clause? Explain with an example.

OR

Consider the following tables. Write SQL statements to perform the given operations.

members (name, address, balance)

orders (orderno, name\_item, qty)

suppliers (sname, saddress, item\_nm, price)

- a) Insert a column ord\_date into the table orders
- b) Print the names of suppliers, items & prices of all suppliers that supply at least one item ordered by BROOKS.
- c) Print the suppliers that supply every item ordered by BROOKS.

(Section-'C')

(Long answer type questions with word limit 300-350) (10x5=50)

Q.1 Describe the ANSI SPARC 3 schema architecture. Why mapping is needed between different schema levels? Explain logical and physical data independence.

OR

Compare three different data model i.e. relational, network & hierarchical Model.

Q.2 Construct an E-R diagram for a car insurance company whose customers own one or more cars. Each car has associated with it zero to any number of recorded accidents. Explain different symbols you use.

OR

Explain ER modeling of aggregation with a case study.

Q.3 Explain what is join? Explain natural join, equi join, left, right outer join by giving example.

OR

Specify the following queries in SQL as well as in relational algebra on database schema given -

- 1) employee (employee-name, street, city)
- 2) works (employee-name, company-name, salary)
- 3) company (company-name, city)
- 4) manages (employee-name, manager-name)
- ii) Find all employees in the database who live in the same cities & on the same streets as do their managers.
- iii) Find all employees in the database who earn more than every employee of Small Bank Corporation.
- iv) Find the names of all employees who work for First Bank Corporation.
- v) Find all employees who earn more than the average salary of all employees of their company,
- vi) Find the company that has the most employees.