Exam. Code : 107203
Subject Code : 1791

Bachelor of Computer Application (BCA) 3rd Semester

DATABASE MANAGEMENT SYSTEM

Paper—II

Time Allowed—3 Hours] [Maximum Marks—75

Note :— There are **EIGHT** questions in the question paper. The candidates are required to attempt any **FIVE** of them. Each question carries **15** marks.

1. (a) Explain the component modules of a DBMS and their interactions with the architecture.

   (b) Describe the main characteristics of the database approach in contrast with the file-oriented approach.

2. (a) An organization purchases items from a number of suppliers. Suppliers are identified by SUP-ID. It keeps track of the number of each item type purchased from each supplier. It also keeps a record of supplier's addresses. Supplied items are identified by ITEM-TYPE and have description (DESC). There may be more than one such address for each supplier and the price charged by each supplier for each item type is stored.

   Identify the entities and relationships for this organization and construct an E-R diagram. From the E-R diagram, write the scripts for creating a schema.

(b) What is normalization of relation ? What is a key attribute in a relation ? What is the difference between 1st normal form, 2nd normal form and 3rd normal form ?

3. (a) What are the major components of the relational model ? What is simple relational database ? What are two models in which you can use SQL ?

(b) Why sequences and indexing are used in Oracle ? What are the Object Oriented features of Oracle 10 g ?

4. (a) What are Tree Walking, Views, Join methods and Sub queries in SQL* PLUS ? Explain with examples.

(b) What is entity integrity and referential integrity constraints ? How to specify these constraints in SQL ?

5. (a) Define a functional dependency. List and discuss the six inference rules for functional dependencies. Give relevant examples.

(b) Explain the distinction between the terms serial schedule and serializable schedule. Give relevant example.

6. (a) Explain non-loss decomposition and dependency preservation with suitable example. How to determine whether the decomposition of a table is loss less or lossy decomposition ?

(b) Consider the following six relations for an Order-processing Database Application in a Company :

CUSTOMER (CUSTNO, CNAME, CITY)

ORDER (ORDERNO, ODATE, CUSTNO, ORD_AMT)

ORDER_ITEM (ORDERNO, ITEMNO, QTY)

ITEM (ITEMNO, ITEM_NAME, UNIT_PRICE)

SHIPMENT (ORDERNO, ITEMNO, WAREHOUSENO, SHIP_DATE)

WAREHOUSE (WAREHOUSENO, CITY)

Here, ORD_AMT refers to total amount of an order; ODATE is the date the order was placed; SHIP_DATE is the date an order is shipped from the warehouse. Assume that an order can be shipped from several warehouses. Specify the foreign keys for this schema, stating any assumptions you make.

7. (a) Consider the following database schema :

Employee(ename, city)

Works(ename, company_name, salary)

Company(company_name, city)

Manages(ename, manager_name)

Give the expressions in relational algebra to express :

(i) The name of all the employees in this database who do not work for BSNL company.

(ii) Name of all employees who live in Amritsar and work for SBOP and earn more than Rs. 10,000.

(iii) Assume that the companies may be located in several cities. Find all companies located in every city in which Infosys is located.

(b) Suppose that we are using extendible hashing on a file that contains records with the following search key values :

3, 5, 7, 11, 17, 19, 23, 29, 31

Show the extendible hash structure for this file if the hash function is h(x) = x mod 8 and bucket can hold three records.

8. Write short notes on :—

- Oracle Architecture
- DBTG
- Database Triggers in ORACLE. 5+5+5=15