This question paper contains 6 printed pages.

Your Roll No. .....

S. No. of Paper : 8177 **HC**
Unique paper code : 62341201
Name of the paper : **Database Management Systems**
Name of course : **B.A. (Prog.) Computer Applications**
Semester : **II**
Duration : **3 hours**
Maximum marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is Compulsory.
*Answer any **five** questions from Question Nos. 2 to 8.*

1. (a) What do you mean by the term data dictionary? 2

(b) Consider the following relational table: 3

Customer

Cust_ID	Cust_Name	Contact	Address	City
1	Aarti	9933445566	A4	Janak Puri
2	Deepak	9988776655	B12	Pitam Pura
3	Sapna	8899776655	C12	Ashok Vihar
4	Gaytri	9911223344	112/14	Janak Puri
5	Uma	9977665544	1133/89	Ashok Vihar
6	Shyam	9922334455	B3	Ashok Vihar
7	Anita	9933445566	C9	Janak Puri

Give the output on execution of each of the following SQL commands on the table **Customer**:

P. T. O.

i. `SELECT COUNT(City) FROM Customer;`

ii. `SELECT COUNT(DISTINCT City) FROM Customer;`

(c) What is a business rule? How does identifying and documenting business rules help in database design? 3

(d) Give an SQL command to create a relational table `Student` having the following attributes: 2

Attribute	Data Type
Roll_No	Integer (3) *primary key*
Name	VARCHAR (max 25 characters)
Age	Number (2)
DOB	Date

(e) Consider an entity **Car** with attributes **Car_Reg, Car_Year, Model, Car_Color**. 3

(Note: **Car_Reg** is the primary key and **Car_Color** is a multivalued attribute)

Draw an E-R diagram for the entity **Car**.

(f) Illustrate the use of referential integrity rule with the help of an example. 2

(g) Given a relation: 2

PRODUCT (PCode, P_Desc, P_Pdate, P_Price)

Write an SQL command to display all the products in ascending order of **P_Price**.

(h) What do you mean by insertion anomaly? Illustrate with the help of an example. 2

(i) What is a *PROJECT* operator? 3

Give the output when the **PROJECT** operator is applied on both the attributes **F_Name** and **L_Name** for the following table:

Salesman

ID	F_Name	L_Name	Age	Total_Sal
101	Shobha	Gupta	28	200000
102	Ankit	Saxena	30	50000
103	Sudhir	Vij	35	250000
104	Madhur	Sharma	27	150000

(j) Consider the table **Employee** 3

Employee

Emp_ID	Emp_Name	D_Code	Salary
1010	Akshay	45	25000
1020	Ankita	32	40000
1030	Geeta	37	23000
1040	Sakshi	27	35000

Differentiate between the following SQL Commands

i. **Delete** From **Employee**;

ii. **Drop** Table **Employee**;

(a) Describe any three advantages of DBMS. 6

(b) What are derived attributes? Illustrate with the help of an example. 4

3. Consider the database for a hospital with a set of patients and a set of medical doctors. The database maintains a record of various tests conducted on each patient:

Patient (**PP#**, **PName**, **Insurance**, **DD#**)

Doctor (**DD#**, **DName**, **Specialization**)

Test (**PP#**, **TestName**, **Date**, **Time**)

Construct an E-R diagram for a hospital with the following constraints:

i. A **doctor** may treat many **patients** but a **patient** is under the supervision of only one **doctor**.

ii. Many **patients** may go for the same **test** and many **tests** may be prescribed to a **patient**.

4. (a) Give an overview of the network data model. Give two disadvantages of the network model.

(b) A database contains the entities **Painter** and **Paintings**. Is the relationship between the **Painter** and **Painting** (1:M) or (1:1)? Justify your answer. Draw an ER diagram for this scenario.

5. Consider the following tables: 10

Order (**OrderID**, **CustID**, **Order_Date**, **Qty**, **Delivery_Date**)

Customer (**CustID**, **CustName**, **City**)

Write SQL commands to:

i. Display all the details of the `order` with `customer name` and `city` where the order quantity is greater than 50.

ii. Display all the details of the `customer` whose `name` starts with 'R'.

iii. Increase the `quantity` of all the orders by 5.

iv. Insert a row in `Customer` table corresponding to the attribute values `10, 'Akash'` and `'New Delhi'` respectively.

v. Add a new attribute (*i.e.* column) `Remarks` with data type varchar(25) in the table `Order`.

---

10 Consider the following relation instances *R1* and *R2* having the same schema

Relation *R1*

Emp_Id	Emp_Name
118	Anuj
112	Sumati
200	Arun
202	Ram

Relation *R2*

Emp_Id	Emp_Name
115	Anita
205	Varuna
202	Ram
118	Anuj

P. T. O.

Find the result of the following operations:

i. ***R2*** *UNION* ***R1***
ii. ***R2*** *DIFFERENCE* ***R1***
iii. ***R1*** *INTERSECT* ***R2***
iv. ***R1*** *PRODUCT* ***R2***
v. *SELECT* ***Id*** < 150
(Note: use the relation ***R2***)

7. (a) Given a database with following relations:

Product(P_Code, P_Desc, P_Price, V_Code)

Vendor(V_Code, V_Name, V_Address, V_Contact)

Identify primary and foreign key for each relation. Make suitable assumptions and state them.

(b) Differentiate between the following:
i. DDL and DML.
ii. Data and Information

(c) What do you understand by cardinality?

8. (a) Describe second normal form with a suitable example

(b) Describe the following DBMS functions:
i. Security management
ii. Data transformation and presentation.