[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1403 A

Unique Paper Code : 42341202

Name of the Paper : Database Management Systems

Name of the Course : B.Sc. (Prog.) / Math. Science

Semester : II

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question 1 is compulsory.
3. Answer any five questions out of remaining questions (Q2–Q8).
4. Answer all parts of a question together.

SECTION A

1. Answer the following :

(a) Draw the notation for the following ER conceptual diagram (3)

P.T.O.

(i) Weak entity

(ii) Multivalued attribute

(iii) Derived attribute

(b) For the following binary relationships, find the cardinality ratio. Clearly, state any assumption you make. (3)

(i) Student and teacher

(ii) Student and class

(iii) Course and Teacher

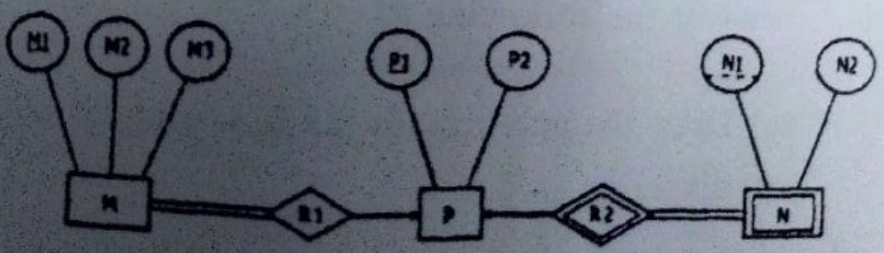
(c) Explain the problem of spurious tuple and how can it be prevented? (3)

(d) Differentiate between the following : (4)

(i) Delete and Drop SQL command

(ii) Database and DBMS

(e) Consider the following ER diagram : (4)



Identify the entities and its attributes in above ER diagram.

(f) What is meant by recursive relationship type? Give an example. (2)

(g) Consider the table named **Customer** having one of the attribute as **CITY**.

Write an SQL query to find all the cities having 'GAR' somewhere in its name. (2)

(h) List any two responsibilities of DBA. (2)

(i) Which SQL command is used to modify the structure of the table? Write its syntax. (2)

SECTION B

2. (a) What is the difference between logical data independence and physical data independence? Which one is harder to achieve? Why? (5)

(b) Discuss the main characteristics of DBMS and how does it differ from traditional file system? (5)

P.T.O.

3. (a) Consider the following table Order : (6)

Order_ID	Order_Price	Customers
1	500	Rajesh
2	300	Ramesh
3	100	Suresh
4	600	Rajesh
5	800	Rajesh
6	900	Suresh
7	400	Rakesh

(i) Write SQL command to create the above table with appropriate constraints.

(ii) Write the output when following query is executed:

1. *Select Customer, sum(Order_Price) from order group by Customers having sum (Order_Price)<=1000*

2. *Select * from Order where Customer Like '%esh'*

(b) Refer to the relational schema given below :

Supplier(Sno, Sname, city)

Parts(Pno, Pname, colour, city)

Projects(Projno, Projectname, city)

Sup_par_proj(Sno, Pno, Projno, Quantity)

Identify the primary key and foreign key in the above relational schema. (4)

4. (a) Consider the two tables T1 and T2 as given below. Show the results of following operations given in Relational Algebra. (10)

T1

P	Q	R
10	a	5
15	b	8
25	a	6

T2

A	B	C
10	a	6
25	a	3
10	b	5

(i) T1 ∪ T2

(ii) T1 – T2

(iii) T2 – T1

(iv) T1 ∩ T2

(v) T1 × T2

P.T.O.

5. A college Library maintains a database about students and books having the following information

- Book including ISBN, title, price and author
- Student includes name, Student ID, address, phone, age and Bdate
- Publisher including Publisher_ID, name, phone and address
- Section includes S_id, name and phone

Construct an ER diagram for the above database.

Specify all entities, their attributes and cardinality relational. State assumptions if any. (10)

6. (a) For the relation given below (in tabular format) identify which of the functional dependency holds true :

J	K	L	M
x	1	2	5
x	1	2	6
y	1	3	7
y	1	3	8
z	2	4	9
p	4	7	5

(i) J, K → L

(ii) $J \rightarrow K$

(iii) $J, K \rightarrow L, M$

(iv) $L \rightarrow K$ (4)

(b) What does the term unnormalized relation refers to?

Consider the following relation :

Car_Sale(Car_no, Date_Sold, Salesman_no, Commission, Discount_amt)

Normalize it in third normal form given that the additional dependencies are :

Date_SoId → Discount_amt

Salesman_no → Commission (6)

7. Consider the following relations(key of each relation is underlined) : (10)

Sales Person(S No, S_Name, Commission)

Product(P Id, Description)

Sale(Date, C No, S No, P Id, Qty)

Customer(C No, C_Name, C_Address)

P.T.O.

Write the following queries in SQL and Relational Algebra

(i) Get the name of the Sales Person who sold Product with P_Id=25

(ii) Get the name of Customers who bought "Table Fans"

(iii) Get the total number of Products sold on "15-09-2020"

(iv) Get the total number of products purchased by each customer (10)

8. Write short note on the following : (10)

(i) Specialization

(ii) Generalization

(iii) Weak Entity Type

(iv) Referential Integrity

(v) Database State