This question paper contains **8** printed pages]

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S. No. of Question Paper : **2928**

Unique Paper Code : **32345201** **IC**

Name of the Paper : **Introduction to Database Systems**

Name of the Course : **General Elective for Honours :**

Computer Science

Semester : **II**

Duration : **3 Hours** Maximum Marks : **75**

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

Q. No. **1** is compulsory. Attempt any *four* questions out of Q. Nos. **2** to **7**. Parts of a question must be answered together.

Marks are indicated against each question.

1. (*a*) Suggest appropriate data types for the following attributes : 3

(*i*) Marks in Examination

(*ii*) Name of an Employee

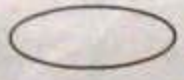
(*iii*) Date of Birth.

P.T.O.

(b) What do the following geometrical shapes represent in an ER Diagram ? 3

(i) 

(ii) 

(iii) 

(c) In each case, draw the geometrical shape to be used in an ER Diagram : 3

(i) Multivalued attribute

(ii) Weak entity type

(iii) Key attribute.

(d) For each of the following commands, indicate whether it belongs to DDL or DML : 4

(i) Create table

(ii) Update table

(iii) Drop table

(iv) Delete from table.

(e) For the given binary relationships, suggest the cardinality ratio of the relationship based on the general context of entity types and state the context clearly : 5

	Entity Type	Relationship	Entity Type
(i)	EMPLOYEE	Has	DEPENDENT
(ii)	EMPLOYEE	Works_on	PROJECT
(iii)	TEACHER	Teaches	STUDENT
(iv)	COLLEGE	Offer	COURSE
(v)	BANK	Has	MANAGER

(f) In the following relational database, point out the primary and foreign keys stating any assumptions that you make : 5

EMPLOYEE(ENumber, Ename, Email, Phone)

PROJECT(ProjectName, ProjectDescription, ProjectManager)

WORKS_ON(ENumber, ProjectName, Hours)

(h) Consider the following Relational database schema :

STUDENT

Rollno	Name	Department	Marks
1	Ramesh	CS	94
2	Narayan	CS	75
3	Murthy	MS	62
4	Priya	MS	89
5	Garima	CS	78

Write SQL queries for the following statements :

(*i*) Insert a new student <7, 'Priyanka','CS',82> in the above database.

(*ii*) Change the Department of ' Ramesh' to 'MS'.

(*iii*) Delete the records where marks are less than 70. 6

2. (a) Consider the relation STUDENT (RollNo, Name, Dept, Marks)

Write the following queries into SQL form :

(*i*) Display the total number of students in each department.

(*ii*) Display minimum, average and maximum marks of the class.

(*iii*) Display the details of the students whose name starts with 'J'. 6

(b) Write *two* advantages of DBMS over traditional file processing. 4

(b) Write SQL query for performing the following tasks on relation schema 4

EMPLOYEE (Eno, Ename, BDate, Address, Dno) :

(i) For displaying employee names having two 'a's in their names.

(ii) For sorting the data of the above table name-wise.

6. (a) EMP_DEPT 6

Ename	Id	Bdate	City	Dno	Dname	DmgrSsn
Kalpna	1	01-05-92	New Delhi	101	Research	3
Daksh	2	02-05-92	Hyderabad	101	Research	3
Nitin	3	11-05-95	Bangalore	102	Admin	4
Anita	4	04-07-92	Mumbai	102	Admin	5
Narayan	5	22-05-82	Hyderabad	105	Headquarter	5

Consider the above relational database schema and give an SQL query for each of the following :

(i) a query that will result in Insertion Anomaly.

(ii) a query that will result in Deletion Anomaly.

(iii) a query that will result in Update Anomaly.

(b) Differentiate between HAVING and WHERE clause with the help of an example. 4

P.T.O.

7. Consider a MOVIEdatabase in which data is recorded about the movie industry.The data requirements are summarized as follows :

- Each movie is identified by title and year of release. Each movie has a length in minutes. Each has a production company, and each is classified under one or more genres (such as horror, action, drama, and so forth). Each movie has one or more directors and one or more actors appear in it.
- Actors are identified by name and date of birth and appear in one or more movies. Each actor has a role in the movie.
- Directors are also identified by name and date of birth and direct one or more movies. It is possible for a director to act in a movie (including one that he or she may also direct).
- Production companies are identified by name and each has an address. A production company produces one or more movies.

Identify:

(*i*) entities of interest.

(*ii*) attributes for each entity.

Draw an ER diagram for the above database. Also specify clearly all constraints on the relationships in the diagram. State clearly any assumptions that you make. 10