Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: IV - CARRY OVER THEORY EXAMINATION - SEPTEMBER 2022

Subject: Database Management Systems

Time: 3 Hours   Max. Marks: 100

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.

2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 mark each.

3. Section B - Question No-3 is based on external choice carrying 6 marks each.

4. Section C - Questions No. 4-8 are within unit choice questions carrying 10 marks each.

5. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A   20

1. Attempt all parts:-

1-a.   The Rectangles in E-R diagram represents   (CO1)   1

           (a) Entity set

           (b) Relationship set

           (c) Attributes of a relationship set

           (d) Primary key

1-b.   Generalization is a bottom-up approach.   (CO1)   1

           (a) TRUE

           (b) FALSE

1-c.   Which SQL keyword is used to retrieve the maximum value?   (CO2)   1

           (a) MOST

           (b) TOP

           (c) MAX

           (d) UPPER

1-d.   What are the join types in join condition?   (CO2)   1

           (a) Cross join

(b) Natural join

(c) Join with USING clause

(d) All of the mentioned

1-e.   Functional Dependencies are the types of constraints that are based on   (CO3)   1

(a) Key

(b) Key revisited

(c) Superset key

(d) None of the mentioned

1-f.   After normalization, the original table can be obtained by –   (CO3)   1

(a) Delete operation

(b) Cascade operation

(c) Join operation

(d) None of the above

1-g.   A Transaction ends   (CO4)   1

(a) only when it is Committed.

(b) only when it is Rolled-back

(c) when it is Committed or Rolled-back

(d) only when it is initialized

1-h.   A deadlock exists in the system if and only if the wait-for graph contains   (CO4)   1

(a) Direction

(b) Cycle

(c) Bi-direction

(d) Rotation

1   Which of the following is a NoSQL Database Type?   (CO5)   1

(a) SQL

(b) Document databases

(c) JSON

(d) All of the mentioned

1   A query may include a _____ that specifies the fields from the matching documents   1
to return   (CO5)

(a) selection

(b) projection

(c) union

(d) none of the mentioned

2. Attempt all parts:-

2.a.	Explain advantages and disadvantages of DBMS. (CO1)	2
2.b.	What is DISTINCT Clause? (CO2)	2
2.c.	Explain the uses of normalization of data. (CO3)	2
2.d.	What are the challenges faced in concurrent transactions? (CO4)	2
2.e.	What is a Collection in MongoDB? (CO5)	2

<div align="center">SECTION B   30</div>

3. Answer any <u>five</u> of the following:-

3-a.   Explain Query Processing with the help of a diagram. (CO1)   6

3-b.   Draw an ER Diagram of an Educational Institute and explain the concept of Aggregation,   6
Specialization and Generalization. (CO1)

3   Write short notes on i) DDL ii) DML iii) Database Schema. (CO2)   6

3   Consider the following relations : (CO2)   6
Hotel {hotelNo, name, address}
Room {roomNo, hotelNo, type, price}
Booking {hotelNo, guestNo, dateFrom, dateTo, roomNo}
Guest {guestNo, name, address}
Write the SQL statements for the following:
a) List the names and addresses of all guests in Chandigarh, alphabetically ordered by name.
b) List all family rooms with a price below Rs.400 per night, in ascending order of price.

3.e.   Let us consider a relation schema R ={A,B,C,D,E,H} having two functional   6
dependency(FD) set F and G, F = {A → C, AC → D, E → AD, E → H}, G = {A → CD,
E → AH}. Check whether two set are equivalent or not. (CO3)

3.f.   Draw a state diagram and discuss the typical states that a transaction goes through during   6
execution. (CO4)

3.g.   Which data model is related with NoSQLl? Explain the different types of NoSQL   6
database. (CO5)

<div align="center">SECTION C   50</div>

4. Answer any <u>one</u> of the following:-

4-a.	Consider a database used to record the marks that students get in different exams of different course offerings. Construct an E-R diagram that models exams as entities, and uses a ternary relationship, for the above database. Assuming and elaborating the attributes to depict the model. (CO1)	10
4-b.	What are views in Database? Explain different types of views in database. (CO1)	10

5. Answer any <u>one</u> of the following:-

5-a.	What do you mean by Joins? Explain various types of join with examples. (CO2)	10
5-b.	Explain Different types of operators in SQL. (CO2)	10

6. Answer any <u>one</u> of the following:-

6	What do you mean by Normalization in Database Management System? Explain various types of Normal Forms with an example of each. (CO3)	10
6	Given a relational Schema R(W, X, Y, Z) and set of Function Dependency FD = { W → X, Y → X, Z → WXY, WY → Z }. Find the canonical cover? (CO3)	10

7. Answer any <u>one</u> of the following:-

7	What is a schedule? Define the concepts of cascading, cascadeless, and strict schedules, and compare them in terms of their recoverability. (CO4)	10
7	Discuss the architecture of a DDBMS. Within the context of a centralized DBMS, briefly explain new components introduced by the distribution of data. (CO4)	10

8. Answer any <u>one</u> of the following:-

8	Explain some of the advantages of NoSQL database. How is NoSQL database and Relational Database Management System or RDBMS different from each other? (CO5)	10
8	What are the different cloud database models? Explain. (CO5)	10