Printed Page:-04 **Subject Code**:- B**MCA0202**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA

SEM: II - THEORY EXAMINATION (2024 **- 20**25 **)**

Subject: Database Systems

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *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. An _____ represents a real world object or thing. (CO1, K1) 1

(a) File
(b) Entity
(c) Record
(d) Attribute

1-b. The constraints on relationship types can be of the type _____(CO1, K1) 1

(a) 1:1
(b) 1:N
(c) N:M
(d) all of the above

1-c. If there is a functional dependency X-> Y(CO2, K2) 1

(a) No two rows can be equal
(b) Wherever the X value agrees, the Y value also agrees
(c) There exists a Superkey
(d) none of the above

1-d. How do you add a column named "email" to a table named "users"?(CO2,K2) 1

(a) ADD COLUMN email TO users;
(b) INSERT COLUMN email INTO users;

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(c) ALTER TABLE users ADD COLUMN email;

(d) MODIFY TABLE users ADD email;

1-e. Which SQL statement will return distinct job titles from the "jobs" table?(CO3, K2) 1

(a) SELECT DISTINCT job_title FROM jobs;

(b) SELECT job_title FROM jobs GROUP BY job_title;

(c) SELECT UNIQUE job_title FROM jobs;

(d) SELECT job_title FROM jobs ORDER BY DISTINCT;

1-f. Which SQL query correctly uses the INTERSECT operator to find common "customer_id" values in "orders" and "returns" tables? (CO3, K2) 1

(a) SELECT customer_id FROM orders JOIN SELECT customer_id FROM returns;

(b) SELECT customer_id FROM orders INTERSECT SELECT customer_id FROM returns;

(c) SELECT customer_id FROM orders UNION SELECT customer_id FROM returns;

(d) SELECT customer_id FROM orders EXCEPT SELECT customer_id FROM returns;

1-g. Which of the following optional structure is used to improve the performance of a query performed on a table in SQL? (CO4, K2) 1

(a) View

(b) Index

(c) Constraint

(d) Table

1-h. Cascading Rollback means _____(CO4, K2) 1

(a) A rollback will in turn cause other transactions to rollback.

(b) A rollback will occur in one transaction

(c) A rollback may or maynot occur in one transaction

(d) None of the above

1-i. A document is a set of ___.(CO5, K1) 1

(a) Key-value pairs

(b) Application pairs

(c) Activity pair set

(d) None of the mentioned above

1-j. How do you update multiple documents in a MongoDB collection?(CO5, K1) 1

(a) db.collection.updateOne()

(b) db.collection.updateMany()

(c) db.collection.updateAll()

(d) db.collection.modifyMany()

2. Attempt all parts:-

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2.a.	Give the levels of data abstraction.(CO1, K1)	2
2.b.	Implement 'Check' constraints with suitable example.(CO2, K3)	2
2.c.	Define cartesion product with example.(CO3, K2)	2
2.d.	Implement trigger in PL/SQL (CO4, K3)	2
2.e.	Write two advantages of MongoDB(CO4,K2)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Draw ER diagram for Ternary Relationship set with suitable example?(CO1, K2)	6
3-b.	Explain Generalization and Specialization with suitable example.(CO1, K2)	6
3-c.	Explain Referential Integrity Constraint.(CO2, K2)	6
3-d.	Explain 1NF and 2NF with suitable example, (CO2, K2)	6
3.e.	Differentiate left outer join, right outer join and full outer join.(CO3, K3)	6
3.f.	Explain the ACID properties with examples.(CO4, K2)	6
3.g.	Explain the terms Databases, Collections and Documents with the help of examples.(CO5, K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Explain the logical and physical data independence in detail. (CO1, K2)	10
4-b.	What are the various constraints on relationship? Explain constraints of EER diagram also. (CO1, K3)	10

5. Answer any one of the following:-

5-a.	Consider the relation scheme R(E, F, G, H, I, J, K, L, M, N) and the set of functional dependencies- (CO2, K3) { E, F } → { G } { F } → { I , J } { E, H } → { K, L } { K } → { M } { L } → { N } what is the key for R?	10
5-b.	Given a relational Schema R(A, B, C, D) and set of Function Dependency FD = { B → A, AD → BC, C → ABD }. Find the canonical cover?(CO2, K3)	10

6. Answer any one of the following:-

6-a.	What do you mean by division operation in relational algebra? Write a query to explain division operation in detail. (CO3, K3)	10
6-b.	Explore the significance of EXISTS and NOT EXISTS operators in SQL queries.Provide examples demonstrating the use of EXISTS and NOT EXISTS to test for the existence or non-existence of rows based on sub-query results. (CO3, K3)	10

7. Answer any one of the following:-

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7-a.	Describe conflict equivalent schedule with example.(CO4, K2)	10
7-b.	Explain cursor in PL/SQL with the help of an example(CO4, K3)	10

8. Answer any one of the following:-

8-a.	Describe NoSQL Data Models with Examples.(CO5, K3)	10
8-b.	Discuss Aggregation in MongoDB with Examples.(CO5, K3)	10

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