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 (2023 - 2024)

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. In general, a file is basically a collection of all related_____.(CO1) 1

(a) Rows & Columns

(b) Fields

(c) Database

(d) Records

1-b. Which of the following is used in the application programs to request data from the database management system?(CO1) 1

(a) Data Manipulation language

(b) Data Definition Language

(c) Data Control Language

(d) All of the above

1-c. The COUNT keyword belongs to which category (CO2) 1

(a) Aggregate Functions

(b) Opeartors

(c) Clauses

(d) All of the mentioned

1-d. Which of the following is not Constraint in SQL? (CO2) 1

(a) Primary Key

(b) Not Null

(c) Check

(d) Union

1-e. If two relations R and S are joined, then the non-matching tuples of both R and S are ignored in (CO3) 1

(a) left outer join

(b) right outer join

(c) full outer join

(d) inner join

1-f. How can you combine the results of two SQL queries? (CO3) 1

(a) UNION

(b) JOIN

(c) CONCATENATE

(d) LINK

1-g. PL/SQL Variable needs to be declared in the –(CO4) 1

(a) Variable Section

(b) Declaration Section

(c) Initialization Section

(d) None of the above

1-h. Which attribute returns TRUE if an INSERT, UPDATE, or DELETE stattement is executed and it affects the database? (CO4) 1

(a) %NOTFOUND

(b) %ISOPEN

(c) %ROWCOUNT

(d) %FOUND

1-i. Most NoSQL databases support automatic _____ meaning that you get high availability and disaster recovery. (CO5) 1

(a) processing

(b) scalability

(c) replication

(d) all of the mentioned

1-j. A document is a set of ___.(CO5) 1

(a) Key-value pairs

(b) Application pairs

(c) Activity pair set

(d) None of the mentioned above

2. Attempt all parts:-

2.a. What are the disadvantages of file processing system 2

2.b. Define referential integrity constraints with example. 2

2.c. How can you modify the UNION query to include duplicate values from both result sets? 2

2.d. Define Commit and explain its use with an example 2

2.e. Write two features of MongoDB 2

SECTION B **30**

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

3-a. What is data independence. Explain both types of data independence with the help of examples.(CO1) 6

3-b. Draw ER diagram for hospital management system.(CO1) 6

3-c. Define and explain 2nd normal form with an example(CO2) 6

3-d. Discuss Armstrong's axioms.(CO2) 6

3.e. Explain the following term Self join, Natural Join, equi join and inner join. (CO3) 6

3.f. Explain the GRANT and REVOKE operations with examples.(CO4) 6

3.g. Explain the terms Databases, Collections and Documents with the help of examples.(CO5) 6

SECTION C **50**

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

4-a. Write short notes on- 10

a) Generalizationa b)Specialization c) Aggregation (d) Attribute Inheritance (CO1)

4-b. What are the various constraints on relationship? Explain constraints of EER diagram also. (CO1) 10

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

5-a.	Write short on following- (i) Group by (ii) Having (iii) Order by (iv) where clause (CO2)	10
5-b.	What do you mean by closure of an attribute set?. Let's suppose we have a set of attributes as S: {A, B, C, D, E, F} and functional dependencies are: (AB -> C, B -> AE, C -> D). Find the candidate key. (CO2)	10

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

6-a.	Define logical operator. Discuss all types of logical operator with appropriate SQL queries. (CO3)	10
6-b.	What do you mean by division operation in relational algebra? Write a query to explain division operation in detail. (CO3)	10

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

7-a.	Explain Lock Based Protocol for concurrency control. How 2PL locking differs from strict 2PL ? (CO4)	10
7-b.	What do you mean by trigger? Write a trigger for automatic storage of transaction detail.(CO4)	10

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

8-a.	Discuss the terms MongoDB, Mongosh, Mongod, Mongodb campass and Mongodb Atlas and explain the advantages of document oriented database (CO5)	10
8-b.	What do you mean by CAP theorem? How ACID differs from BASE? (CO5)	10