Printed Page:- Subject Code:- BMCA0202Z

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA

SEM: II - THEORY EXAMINATION (20..... - 20.....)

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. The architecture of a database can be viewed as the _____ [CO1 K1] 1

(a) One level
(b) Two-level
(c) Three-level
(d) Four level

1-b. Double ellipses represent _____ [CO1 K1] 1

(a) Derived attributes
(b) MultiValued Attributes
(c) total participation of an entity in a relationship set
(d) Weak entity type

1-c. The core of primary key constraint is given by [CO2 K1] 1

(a) NOT NULL, CHECK
(b) NOT NULL, DEFAULT
(c) NOT NULL, FOREIGN KEY
(d) NOT NULL, UNIQUE

1-d. What is the meaning of ORDER BY constraint [CO2 K1] 1

(a) sorting your result column wise
(b) sorting your result row wise
(c) aggregation of rows

(d) None of the above

1-e. If two relations R and S are joined, then the non-matching tuples of both R and S are ignored in [CO3 K1] 1

(a) left outer join
(b) right outer join
(c) full outer join
(d) inner join

1-f. What does the SQL IN clause do? [CO3 K1] 1

(a) Allows you to specify multiple values in a WHERE clause
(b) Joins two tables together
(c) Creates a new table in the database
(d) Changes the values in a column

1-g. Collections of operations that form a single logical unit of work is called _____ [CO4 K1] 1

(a) View
(b) Network
(c) Unit
(d) Transaction

1-h. The process of managing simultaneous operations on the database without having them interfere with one another is [CO4 K1] 1

(a) Serializability
(b) Recoverability
(c) Concurrency control
(d) Transaction management

1-i. Aggregation operations in MongoDB ___ values from multiple documents. [CO5 K1] 1

(a) Data set
(b) Set
(c) Group
(d) None of the mentioned above

1-j. Which method removes a single document that matches a filter? [CO5 K1] 1

(a) truncateOne()
(b) deleteOne()
(c) dropOne()
(d) Both Aand B

2. Attempt all parts:-

2.a. Define schema and instance with the help of suitable example. [CO1 K2] 2

2.b. Describe foreign key and its application. [CO2 K3] 2

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2.c.	Discss the purpose of EXISTS operator in a subquery. [CO3 K2]	2
2.d.	Discuss trigger in PL/SQL. [CO4 K2]	2
2.e.	Define MongoDB aggregation pipeline. [CO5 K3]	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Implement DDL, DML, TCL & DCL commands on any relation. [CO1 K3]	6
3-b.	What is data independence. Explain both types of data independence with the help of examples. [CO1 K2]	6
3-c.	Define Normalization along with its advantages and disadvantages.[CO2 K2]	6
3-d.	Differentiate lossless and lossy join decomposition with suitable example. [CO2 K2]	6
3.e.	Explain Left outer join and Right outer join with suitable example. [CO3 K2]	6
3.f.	Explain the cascadeless schedule with the help of an exmaple. [CO4 K2]	6
3.g.	Describe comparison opeartors, -eq, -gt, -lt, -gte, -lte in MongoDB with examples. [CO5 K2]	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Construct an EER diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted. Map your EER diagram to the relational model. [CO1 K3]	10
4-b.	Write short notes on the following relational algebra operations: a) Selection b)Projection c) Division d) Rename [CO1 K2]	10

5. Answer any one of the following:-

5-a.	Given a relational Schema R(V, W, X, Y, Z) and set of Function Dependency FD = { V → W, VW → X, Y → VXZ }. Find the canonical cover? [CO2 K3]	10
5-b.	Suppose we have a relation R(ABCD) with some FD's F as follows: A->B, B -> C, C -> D, D -> A, Compute closures A+ , C+, AB+, AC+ and find out the candidate keys. [CO2 K3]	10

6. Answer any one of the following:-

6-a.	Discuss the significance of the LIKE, BETWEEN & DISTINCT operator in SQL queries. Explain how LIKE enables pattern matching for text data and discuss its practical applications in data retrieval and analysis. [CO3 K2]	10
6-b.	Discuss subquery, nested subquery and corelated subquery with the help of suitable examples . [CO3 K4]	10

7. Answer any one of the following:-

7-a.	Explain Conflict Serializability in detail with Exmaple. [CO4 K2]	10
7-b.	Explain cursor in PL/SQL with the help of an example. [CO4 K2]	10

8. Answer any one of the following:-

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8-a.	Describe CRUD Operations with Examples.[CO5 K2]	10
8-b.	Describe CAP Theorem in detail. [CO5 K2]	10

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