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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2022-2023)

Subject: Advanced Database Management 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

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1. Attempt all parts:-

- 1-a. Which of the following schemas does define a view or views of the database for particular users? (CO1) 1
- (a) Internal schema
 - (b) Conceptual schema
 - (c) Physical schema
 - (d) External schema
- 1-b. Query evaluation plans are also known as query ____ plans. (CO1) 1
- (a) Execution
 - (b) Enumeration
 - (c) Eternal
 - (d) None
- 1-c. A collection of data designed to be used by different people is called a/an (CO2) 1
- (a) Organization

- (b) Database
- (c) Relationship
- (d) Schema
- 1-d. _____ is a procedural extension of Oracle – SQL that offers language constructs similar to those in imperative programming languages. (CO2) 1
- (a) SQL
- (b) PL/SQL
- (c) Advanced SQL
- (d) PQL
- 1-e. How to create a database in mongodb? (CO3) 1
- (a) create databaseName
- (b) new databaseName
- (c) Use databaseName
- (d) None
- 1-f. NoSQL databases is used mainly for handling large volumes of _____ data. (CO3) 1
- (a) Structured
- (b) Unstructured
- (c) Semi-structured
- (d) None
- 1-g. Which of the unit operation is used in Model view controller? (CO4) 1
- (a) Is a Decomposition
- (b) Part Whole Decomposition
- (c) All of the mentioned
- (d) None of the mentioned
- 1-h. Data warehouse based on: (CO4) 1
- (a) 1D model
- (b) 2D model
- (c) 3D model
- (d) Multidimensional model
- 1-i. Why is redaction important? (CO5) 1
- (a) To ensure confidentiality of sensitive information
- (b) To ensure the availability of sensitive information

- (c) To ensure the integrity of sensitive information
- (d) To ensure the authenticity of sensitive information
- 1-j. What is the main objective of database auditing? (CO5) 1
 - (a) To ensure the accuracy of the data stored in the database
 - (b) To monitor and control access to the database
 - (c) To improve the performance of the database
 - (d) To facilitate the backup and recovery of the database

2. Attempt all parts:-

- 2.a. What are the different datatypes used in SQL? (CO1) 2
- 2.b. What is concurrent execution in distributed database. (CO2) 2
- 2.c. What are Databases in MongoDB? (CO3) 2
- 2.d. How constraint can be disabled in a database? (CO4) 2
- 2.e. What is a database audit trail? (CO5) 2

SECTION B

30

3. Answer any five of the following:-

- 3-a. Explain how the GROUP BY clause in SQL works. (CO1) 6
- 3-b. Explain query transformation and query optimization. (CO1) 6
- 3-c. Define concept of data independence & Atomicity in Distributed database. (CO2) 6
- 3-d. What is concurrency control and how it is implemented? (CO2) 6
- 3.e. What is the CAP theorem for database sharding? What is CAP theorem in a distributed database system? (CO3) 6
- 3.f. Describe the importance of multimedia in various fields. (CO4) 6
- 3.g. What are some of the main challenges your organization has faced in implementing and managing NoSQL databases? (CO5) 6

SECTION C

50

4. Answer any one of the following:-

- 4-a. What are the different features of RDBMS? Define the object-oriented model? (CO1) 10
- 4-b. Discuss the actions taken by the read-item and write-item operations on a database. (CO1) 10

5. Answer any one of the following:-

- 5-a. What is the importance of concurrency control? What are the different types of 10

concurrency techniques? (CO2)

- 5-b. What are the various methods of concurrency control in distributed database? 10
How is concurrency control implemented in a distributed database? (CO2)

6. Answer any one of the following:-

- 6-a. What are the limitations of RDBMS? List and explain the barriers of NoSQL. 10
(CO3)
- 6-b. What is the meaning of document-oriented DB? What is sharding in MongoDB? 10
What are the alternatives to MongoDB? (CO3)

7. Answer any one of the following:-

- 7-a. Provide a brief explanation of the following advanced data types and concepts 10
in databases, highlighting their main features, advantages, and applications?
(CO4)
- 7-b. Explain the ETL process in a data warehouse? (CO4) 10

8. Answer any one of the following:-

- 8-a. Explain the difference between SQL and NoSQL databases, and provide an 10
example of a scenario where each type of database would be preferable.
(CO5)
- 8-b. What are the best practices for implementing redaction and masking 10
techniques to protect sensitive data? (CO5)