NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MBA

SEM: IV - THEORY EXAMINATION (2022-2023)

Subject: Data Base Technology

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.*

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SECTION A   **20**

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1. Attempt all parts:-

1-a.   Which type of data can be stored in the database? (CO1)   1

         (a) Image oriented data

         (b) Text, files containing data

         (c) Data in the form of audio or video

         (d) All of the above

1-b.   DBMS helps to achieve_____(CO1)   1

         (a) Data independence

         (b) Centralized control of data

         (c) Control redundancy

         (d) All of the above

1-c.   A row in a table is also know as (CO2)   1

         (a) tuple

         (b) Field

         (c) Entity

(d) Table

1-d.   Relational Algebra is a _____ query language that takes two relations as input and produces another relation as an output of the query.(CO2)   1

       (a) Relational

       (b) Structural

       (c) Procedural

       (d) Fundamental

1-e.   The situation where the lock waits only for a specified amount of time for another lock to be released is (CO3)   1

       (a) Lock timeout

       (b) Wait-wound

       (c) Timeout

       (d) Wait

1-f.   SQL Views are also known as (CO3)   1

       (a) Simple tables

       (b) Virtual tables

       (c) Complex tables

       (d) Actual Tables

1-g.   The data is stored, retrieved & updated in _____. (CO4)   1

       (a) OLAP

       (b) OLTP

       (c) SMTP

       (d) FTP

1-h.   Which one is correct regarding MOLAP? (CO4)   1

       (a) Data is stored and fetched from the main data warehouse

       (b) Use complex SQL queries to fetch data from the main warehouse

       (c) Large volume of data is used

       (d) All are incorrect

1-i.   Log records contain (CO5)   1

       (a) Old value

       (b) New value

       (c) Both a and b

       (d) Error value

1-j. What is P Stand for in "CAP" Theorem ? (CO5) 1

       (a) Consistency

       (b) Availability

       (c) Partition

       (d) Partition Tolerance

2. Attempt all parts:-

2.a. Define DBMS. (CO1) 2

2.b. What do you mean by instances and schemas? Explain with Examples.(CO2) 2

2.c. Explain the Domain Relational Calculus in brief. (CO3) 2

2.d. Define the OLAP. (CO4) 2

2.e. What is CRUD in MongoDB? (CO5) 2

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SECTION B 30

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

3-a. Differentiate between physical and logical data independencies. (CO1) 6

3-b. Draw overall structure of DBMS and explain its components in brief. (CO1) 6

3-c. Construct an E-R 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. (CO2) 6

3-d. Explain the different types of join with example.(CO2) 6

3.e. What is schedule? Differentiate between conflict and view serializable schedule with example.(CO3) 6

3.f. Explain the architecture of a data warehouse.(CO4) 6

3.g. Enlist differences between SQL databases and NoSQL databases. (CO5) 6

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SECTION C 50

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

4-a. Why is the relational data model successful over the hierarchical and network model? (CO1) 10

4-b. Compare and contrast the differences between File Processing System and DBMS?(CO1) 10

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

5-a. List the ACID properties. Explain the usefulness of each property. (CO2) 10

5-b. Explain the selection, projection and rename operator in relational algebra with example.(CO2) 10

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

6-a.   Explain Concurrency control with 2 -Phase locking methods. (CO3)   10

6-b.   Explain the time stamp-based protocols with example.(CO3)   10

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

7-a.   Explain the use of facts, dimensions, and attributes in the star schema and   10
         explain performance improvement techniques used in star schemas.(CO4)

7-b.   Design a Snowflake schema of University with all the dimensions and keys   10
         mentioned in it.(CO4)

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

8-a.   What is the CAP theorem how is it applicable to NoSql system? (CO5)   10

8-b.   Explain deferred and immediate database Modification technique with   10
         example.(CO5)