Printed Page:- 05 **Subject Code**:- **AMCA0202**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA

SEM: II - THEORY EXAMINATION (2022-2023 **)**

Subject: Database Management System

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 the relational table, which of the following can also be represented by the term "attribute" (CO1) 1

(a) Entity

(b) Row

(c) Column

(d) Both B &C

1-b. Degree of Relation (Table) means (CO1) 1

(a) Number of tuples

(b) Number of entities

(c) Number of constraints

(d) Number of Attributes

1-c. Grant and Revoke commands are (CO2) 1

(a) DDL

(b) DML

(c) DCL

(d) TCL

1-d. TCL commands are (CO2) 1

(a) rollback and commit

(b) create and alter

(c) update and delete

(d) grant and revoke

1-e. If B is an attribute and A→B, Then B is said to be _____ by A. (CO3) 1

(a) Logically implied

(b) Functionally implied

(c) Logically determined

(d) Functionally determined

1-f. If there is a functional dependency X-> Y (CO3) 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-g. View Serializability also (CO4) 1

(a) ensures conflict serializability

(b) does not ensure conflict serializability

(c) may or may not ensure conflict serializability

(d) None of the mentioned

1-h. The vertical fragmentation ensures _____ (CO4) 1

(a) Fragmentation is done Row wise

(b) Fragentation is done Column Wise

(c) Fragemntation is Done randomly

(d) Fragmentation is done index wise

1-i. In shrinking phase all locks are _____ (CO5) 1

(a) Acquired

(b) Released

(c) Recovered

(d) None of the above

1-j. Disadvantage of uncontrolled concurrency? (CO5) 1

(a) Lost Update

(b) Dirty Read

(c) Incorrect analysis of data

(d) All of the above

2. Attempt all parts:-

2.a.	What are the different types of attributes and their notations in ER diagram? (CO1)	2
2.b.	What do you mean by database object views? How does materialized view differ from simple view? (CO2)	2
2.c.	Define BCNF. How does it differ from 3NF? (CO3)	2
2.d.	Define validation based protocols. Is it optimistic or pessimistic approach? (CO4)	2
2.e.	Discuss 2 Phase Locking Protocol and compare it with strict 2 Phase Locking Protocol. (CO5)	2

SECTION B **30**

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

3-a.	Explain three-tier architecture of DBMS? (CO1)	6
3-b.	What are weak entity types and strong entity types? Explain identifying relationship with the help of suitable example (CO1)	6
3-c.	Where do we use division relational algebra operation? Explain it with the help of an example (CO2)	6
3-d.	Write SQL statement to insert values in the table through keyboard. (CO2)	6
3.e.	What do you mean by partial functional dependency? Define 2 NF with the help of suitable example. (CO3)	6
3.f.	Write an algorithm to test whether the given non serial schedule is conflict serializable or not. (CO4)	6
3.g.	Discuss 2 Phase Commit Protocol and how do you remove blocking condition of this protocol? (CO5)	6

SECTION C **50**

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

4-a.	Design ER diagram for school admission process. Assume entities and their attributes. (CO1)	10
4-b.	Describe important characteristics of extended ER model. (CO1)	10

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

5-a. What is meant by cursors in PL/SQL? Explain it with suitable examples. (CO2) 10

5-b. Consider the following relational database 10

Employee(e-id,ename, street, city)

Works(e_id,company_name,salary)

Company(company_name, city)

Managers(e_id, m_id)

Write SQL commands for each of the following queries

(i) Find the name of all employees who live in the same city and on the same street as do their managers

(ii) Find the name of all employees in the database who do not work for "Wipro"

(iii) Find the name of all employees who earn more than every employee of "TCS"

(iv) Give all managers in this database a 10% salary raise. (CO2)

6. Answer any one of the following:-

6-a. Write an algorithm to find out closure of an attribute set. 10

Consider following relation and FD set

R(A,B,C,D,E)

F={A->B, BC->E, ED->A}

Check whether R is in 3NF? Also find that whether it is in BCNF. (CO3)

6-b. What do you mean by Loss less join decomposition? 10

Consider the relational schema:

R(A,B,C,D,E,F,G,H} with the FDs AB->C, BC->D,E->F, G->F,H->A, FG->H

R1(A,B,C,D)

R2(A,B,C,E,F)

R3(A,D,F,G,H)

Is decomposition of R into R1,R2,R3 is lossless? (CO3)

7. Answer any one of the following:-

7-a. What do you mean by timestamp ordering protocol? Explain the salient features of timestamp ordering protocol. (CO4) 10

7-b. Check whether the given schedule S is conflict serializable or not- S : R1(A) , R2(A) , R1(B) , R2(B) , R3(B) , W1(A) , W2(B) (CO4) 10

8. Answer any one of the following:-

8-a. What do you mean by multiple granularity? Discuss it with a suitable example. (CO5) 10

8-b. Describe the following terms: (CO5) 10

(i) NoSQL

(ii) New SQL

(iii) Big Data

(iv) Structured Vs Unstructured Data

(v) JSON vs BSON