Roll No:

MCA
(SEM II) THEORY EXAMINATION 2023-24
DATABASE MANAGEMENT SYSTEMS

TIME: 3 HRS **M.MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

Q no.	Question	Marks	CO
a.	What do you mean by logical data independence?	02	1
b.	What do you mean by data integrity?	02	1
c.	Define entity and entity set. Give one example for illustration	02	2
d.	Explain with suitable example: Stored & Derive Attribute.	02	2
e.	Determine the Relational Algebra expression for following- For a relation Employee(EID, Ename, city), find the name of employees who either live in Delhi or live in Mumbai.	02	2
f.	There is a table named EMP (ID, Name, DOJ). Write the sql query to display all the customer details. (Note – Date of joining must be displayed in the format '07/December/2019')	02	3
g.	What will be the number of possible superkeys for the relation schema R(E,F,G,H) with EF as key ?	02	3
h.	Consider a relation R (A, B, C, D, E) with following FD's: A ->BC, CD -> E, B -> D, E -> A Does B -> CD? Exists over the relation R?	02	3
i.	What do you mean by commit point of a transaction?	02	4
j.	What do you mean by a serializable schedule?	02	5

SECTION B

2. Attempt any *three* of the following: 3 x 10 = 30

a.	Explain the advantages of database systems over file-oriented system.	10	1
b.	Consider the following scenario for a college database. 1. Students enroll for a course. 2. There are some departments. 3. Departments have faculty members. 4. Each department runs some courses. Draw an E-R diagram. Convert the E-R Diagram into relational model.	10	2
c.	What do you mean by Time Stamp? Discuss time Stamp ordering protocol in detail.	10	4
d.	Consider a relation R (A, B, C, G, H, I) and set of functional dependencies F{A → B, A → C, CG → H, CG → I, B → H}. Is AG a super key for the relation R? Is AG a candidate key?	10	3
e.	Write the reasons for a transaction failure. Explain the check point mechanism used to recover from a transaction failure.	10	5

SECTION C

3. Attempt any *one* part of the following: 1 x 10 = 10

a.	With a neat diagram discuss the three-level architecture of DBMS	10	1
b.	Explain with example, how data redundancy leads to data inconsistency.	10	1

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4. Attempt any *one* part of the following: 1 x 10 = 10

a.	For a relation ClientMaster[Client_No(Varchar, primary key), Name(Varchar, not null), Address1(Varchar), City(Varchar, default 'Delhi'), Pincode(Number), Bal_Due(Float), find the SQL queries for following- 1. Create the given relation. 2. Add new field as state in the relation 3. Remove the city field from the relation. 4. Remove the existence of ClientMaster relation 5. Rename clientMaster to Client_Master	10	2
b.	A table named EMP(Empid, Name, DOB, Address, Passport_No, Lisence_No, SSN) is there. Find out the following: Alternative Keys, Non-key Attributes, Non-Prime attributes, Prime Attribute	10	2

5. Attempt any *one* part of the following: 1 x 10 = 10

a.	Demonstrate inner-join and outer-join with suitable example.	10	2
b.	How is a trigger different from procedure? Illustrate a trigger which will insert the updated salary as well as the old salary of an employee into a table named emp_audit.	10	2

6. Attempt any *one* part of the following: 1 x 10 = 10

a.	What is transitive functional dependency? Explain how insertion anamoly, updation anamoly and deletion anamoly occurs when a relation is having transitive functional dependency?	10	3
b.	Define BCNF. Illustrate your answer with a suitable example.	10	3

7. Attempt any *one* part of the following: 1 x 10 = 10

a.	What do you mean by concurrency? Demonstrate how 2 phase locking protocol can be useful for controlling the concurrency. Discuss the different variations of 2PL.	10	4
b.	What do you mean by deadlock prevention? Discuss the Wait-Die and Wound-Wait deadlock prevention algorithm	10	5