2/41 **2001E1212** Candidate's Seat No :_____

MCA Sem.-1 Examination

Relational Database & Mgmt Systems

Time : 3-00 Hours] **January-2025** **[Max. Marks : 50**

Instructions:

- **Write both the Sections in the separate answer book.**
- **Both Sections having equal weightage.**
- **Draw Diagrams wherever necessary.**
- **Make Assumptions wherever necessary.**

SECTION – I

Q-1 **Attempt the following (any two)** **10**

1. Explain the concept of Data Modeling in DBMS and discuss the importance of the three-level architecture of DBMS.
2. List and explain various functions performed by DBA.
3. Compare: DBMS and File Processing System.

Q-2 **Given the following entities for a Software company.** **10**

- Employee with name, Date of Birth, Address
- IT Consultant is an Employee
- Programmer is an Employee
- Project with name, budget, Start Date and End Date.
- Programming Language with Name.
- Both IT Consultants & Programmers are Employees.

In addition there are following relationships:

- An IT Consultant may supervise many projects; a project can be supervised by only one IT Consultant
- A programmer works on at most two projects; at least one Programmer works for a Project; The working hours are registered for each project of each programmer.
- A programmer uses at least one programming Language; A programming Language is used by any number or programmers.
- In a Project exactly one programming language is used. A programming Language can be used by any number of Projects.

OR

Q-2 List and explain any five ER Diagram symbol with their meaning **10**

Q-3 **Do as directed** **5**

1. What is constraint? Write only name of all constraint? When table level primary key constraint is compulsory? **2**
2. What do you mean by entity integrity rule? How do you maintain entity integrity rule in a relation? **2**
3. State : True or False **1**

A single valued attribute is not necessarily a simple attribute.

(P.T.O)

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SECTION – II

Q-4 Attempt the following (any two) **10**

1. What is normalization? Why is it required? Explain Insert, Update and Delete anomalies with appropriate example.
2. Define the following with example
   i. Super Key ii. Candidate Key iii. Data Dictionary iv. Primary key v. Alternat Key
3. Convert the following unnormalised data into third normal form

Invoice#	Invoice Date	Custno	Customer Name	Titleid	Tname	Qty	Cost
101	01-03-05	C1	Mohan	T1	Oracle	200	199
				T2	C	300	299
102	02-03-05	C2	Ram	T3	SQL Server	795	399
105	12-03-05	C1	Mohan	T4	C++	595	499
				T2	C	105	299

Shows the FDs and then normalize the table.

Q-5 Attempt the following (any three) **15**

1. Describe the concept of Transaction state with appropriate diagram.
2. Explain the ACID properties in database transactions.
3. What is Concurrency Control in DBMS? Explain Lock-based concurrency control (2PL)
4. Discuss the different types of database backups (full, incremental, differential) and explain the techniques used for forward recovery.
5. What is a NoSQL database? Discuss the different types of NoSQL databases and their key characteristics. Compare SQL and NoSQL databases.