Roll No.....

TMC - 201

End Term Examination June 2024

MCA 2nd – Semester

Advance Database Management System

Time: Three (3) Hrs

Maximum Marks: 100

Instructions to Students:

1. This question paper contains Five questions.
2. All Questions are compulsory
3. Answer any two sub questions among a, b and c in each main question.
4. Total marks assigned to each question are twenty.

(Attempt any two questions of choice from a,b and c) (2 x 10 = 20 Marks) CO1

Q1. a) Define DBMS and RDBMS. Explain various Components of DBMS using detailed diagram.

b) What is an ER Diagram? Draw ER Diagram for a Hospital. Assume that the hospital has various specialized doctors and Registered patients can book an appointment with those doctors with a specified Fees. Convert it into set of tables. Show final tables with sample values.

c) "Codd's Rules are the building blocks of RDBMS". Explain this using proper examples.

(Attempt any two questions of choice from a,b and c) (2 x 10 = 20 Marks) CO2

Q2. a) What is closure of an FD? Write Algo. Consider the following FD Set F of R(ABCDEHG) { AB→ C , D→EG, C→D, AB→H, H→G } Compute The Closure of AB and CD. Which one of them is Candidate Key? Show All Steps Properly.

b) What is 3NF (Third Normal Form) ? Analyze the following table and see if it is in 3NF or not? and then Normalize the Table in correct smaller tables and Show Final Tables With Values. Follow and write proper steps. (Table : GASCOMPANY, CompCode is Primary Key)

CompCode (PKey)	CompName	CylinderType	GasVolume
101	Indane	Large	14
102	Bharat	Small	5
103	GAIL	Small	5
104	ONGC	Large	14
105	SHELL	Large	14
106	Castrol	Small	5
107	Reliance	Large	14

c) What is the need and Importance of query Optimization? Discuss its key features.

(PTO)

(Attempt any two questions of choice from a,b and c) (2 x 10 = 20 Marks) CO3

Q3. a) Explain Natural and Outer Join using Proper SQL examples and sample table values/rows.

b) List various categories/Types of functions available in SQL. Write 2 or 3 SQL Example of each type of SQL Functions. Assume a Sample Table like:-
STUDENT(Rollno,Name,DOB,Phonenumber) and Write all function examples using this table only. (First Show Sample values/Records/Rows of STUDENT Table).

C) Consider The Following "PROJECT" table and Answer These SQL Queries

EmpCode	EmpName	EmpSalary	Project	Cost
101	Rohit	80000	Java	12000
102	John	60000	C++	45000
103	Sumit	75000	Java	30000
104	Akash	30000	Python	77000
105	Suman	25000	React	25000
106	Shweta	35000	C++	44000
107	Sameer	22000	Java	63000

Write SQL Queries For Following based on Above Table

i) Display 2nd Highest Salary.
ii) Display Project Wise Total Cost.
iii) Display Total Number of each Type of Project.
iv) Show Name of Employee working in Most expensive Project.
v) Increase the cost of all project by 10%

(Attempt any two questions of choice from a,b and c) (2 x 10 = 20 Marks) CO4

Q4. a) What is serializabilty? What are the 3 Conditions for Conflicting operation? Explain conflict serializability using example.

b) Explain any two(2) of the following:
i) 2 Phase Locking Protocol
ii) Deadlock and Starvation
iii) Recovery Techniques

c) Explain Lost update and Inconsistent Read Problems in concurrency using proper Examples.

(Attempt any two questions of choice from a,b and c) (2 x 10 = 20 Marks) CO4

Q5. a) What are parallel and distributed databases? Explain their features and characteristics.

b) Discuss the various architectures of parallel databases.

c) Explain how query is evaluated in distributed databases.