(***Please write your Exam Roll No.***) ***Exam Roll No ……***

END TERM EXAMINATION

FIRST SEMESTER SUPPLEMENTARY EXAM [MCA] NOVEMBER 2025

Paper Code: MCA -107 **Subject: Database Management Systems**

Time: 3 Hours **Maximum Marks: 60**

Note: Attempt FIVE questions in all. Question No. 1 is compulsory and attempt one question from each unit.

1.	Answer **any Four** of the following questions: -		4 x 5 = 20
	(a)	Discuss deadlock handling in transaction.	
	(b)	Analyse the concept of an Identifying Relationship in an Entity-Relationship model. Explain how it differs from a non-identifying relationship and illustrate with an example of entities where an identifying relationship is necessary	
	(c)	Explain with examples the advantages of using a DBMS over a traditional file-based system.	
	(d)	Explain Distributed Database Management Systems.	
	(e)	Give the difference between LEFT & RIGHT outer join using an example.	
	(f)	Explain the Structure of PL/SQL Block,	
		UNIT - I	
2.	(a) Explain database abstraction in detail, and what are various levels are in the context of the abstraction. (b) Design a three-tier schema architecture for a student class representative polling system.		5 5
		OR	
3.	(a) A company is planning to move from a file-processing system to a full DBMS environment. Briefly compare the hierarchical, network, and relational data models. Provide one real-world application for each model where it is the most suitable choice. (b)A university wants to maintain information about Departments, Professors, Courses, and Students. Draw an ER diagram for the above scenario, clearly showing entities, attributes, relationships, keys, and mapping constraints.		5 5
		UNIT - II	
4.	(a) A company database contains the following relation: EMPLOYEE(EmpID, Name, DeptID, Salary, Email) DEPARTMENT(DeptID, DeptName, ManagerID) Explain Entity Integrity, Referential Integrity, Domain Constraints, and Key Constraints with respect to the above relations. (b) Consider the following tables: EMP(EmpID, Name, DeptID, Salary) DEPT(DeptID, DeptName) PROJECT(PID, EmpID, Hours) a) Display employees whose salary is greater than the average salary of all employees.		5 5

	b) List the department name and number of employees in each department (include departments with zero employees).	
	OR	
5.	(a) Given relation PRODUCT(PID, PName, Category, Price): Write a Domain Relational Calculus (DRC) query to list the names of products belonging to the category "Electronics". (b)Briefly explain the following Set Operations: Unions, intersections, and Minus.	5 5
	UNIT - III	
6.	(a) Consider the following relation ORDER(OrderNo, OrderDate, CustName, CustEmail, ProductID, ProductNAme, Price, Quantity) with following FDs: OrderNo → OrderDate, CustName ProductID → ProductName, Price CustName→CustEmail OrderNo, ItemNo→Quantity Apply normalization until you cannot decompose it further. (b)List all candidate keys of R={A,B,C,D,E} FDs={AB→ C, D→ A, AE→B, CD→E, BE→D}.	5 5
	OR	
7.	(a) Write a PL/SQL block to accept an employee ID and display the employee's name and salary. If the salary is greater than 50,000, display "High Salary"; otherwise, display "Normal Salary". (b) Create a function Total_Salary(DeptID) that returns the sum of salaries for a given department.	5
	UNIT - IV	
8.	(a) Describe the situation for a catastrophic failure. How to recover from such a failure. (b) Check whether the schedule is serializable or not??	5 5

T1	T2	T3
R(x)		
		R(y)
		R(x)
	R(y)	
	R(z)	
		W(y)
	W(z)	
R(z)		
W(x)		
W(z)		

	OR	
9.	(a)In the table below some of the transactions with schedules are given. Analyse it carefully and write for the rollback option if any.	5

T1 (10)	T2 (20)

Read (A)		
Write (A)		
	Read (A)	
	Write (A)	
	Read (B)	
Write (B)		

5

(b) Discuss all the concepts of an object-oriented database management system.