

Reg.No. _____

24538

Velammal College of Engineering and Technology
Viraganoor, Madurai – 625 009
(Autonomous)

B.E./B.Tech End Semester Examinations April 2025

Fourth Semester
Time : 3 Hours

Regulation 2021
Max. Marks 100

21CS206-Database Management Systems
(Common to CSE and IT)

Answer ALL Questions
PART-A (10 x 2 = 20 Marks)

1. Outline the use of 'COMMIT' and 'ROLLBACK' in SQL.
2. Show the process to use SQL statements in the High Level Languages.
3. What do you mean by mapping cardinality? Give the different way of mapping.
4. What do you mean by lossless decomposition?
5. Distinguish Conflict serializability and View serializability.
6. Illustrate 2-Phase Locking protocol with an example.
7. Distinguish static hashing and dynamic hashing
8. Describe 'Cost based query optimization'.
9. Differentiate Scale-Up and Scale-Out scaling techniques adopted in NoSQL.
10. Compare the RDBMS and the NoSQL databases.

Part – B (4 x 16 = 64 Marks)

11. a) For the given relational schema

Customer (Custid, Custname, Age, phone)

Loan (Loanid, Amount, Custid, EMI)

- a) Create the tables with constraints. (4)
- b) List the name of the customers who have taken loan for more than Rs.50,000. (4)
- c) List the Customer id of those who have no loan. (4)
- d) List the total count of loan availed. (4)

OR

- b) Consider the following relational schema. For the following questions give the query in both SQL and Relational Algebra.

Person (person-name, street, city)

Works (person-name, company-name, salary)

- a) Find the names of all employees who work for 'TCS' company. (3+3)
- b) Find the names and cities of residence of all employees who work for 'TCS' company. (3+3)
- c) Find the persons who are not working. (2+2)

12. a) Explain the various components of ER model with a suitable example.

OR

- b) What is a Functional Dependency? Explain the various Functional Dependencies and its usage with a suitable example.

13. a) Utilize the concept of 'Lost update', 'Uncommitted read', 'Non-repeatable read' and 'Phantom read' for demonstrating the amount transfer from account 'A' to account 'B'.

OR

- b) Consider four schedules S1, S2, S3, S4 of T1 and T2 as given below. Which of the following schedules are conflict-serializable? Justify your answer.

S1 = r1[X] r2[X] r2[Y] w1[X] w1[Y] w2[Y]

S2 = r1[X] r2[X] r2[Y] w1[X] w2[Y] w1[Y]

S3 = r1[X] w1[X] r2[X] w1[Y] r2[Y] w2[Y]

S4 = r1[X] r2[Y] r2[X] w1[X] w1[Y] w2[Y]

14. a) Explain the Graph based database in NoSQL with suitable example.

OR

- b) Explain the Key-Value pair storage database in NoSQL with suitable example.

Part – C (1 x 16 = 16 Marks)

15. a) Suppose that we are using extendable hashing on a file that contains records with the following search key values 2, 3, 5, 7, 11, 17, 19, 23, 29, 31. Show the extendable hash structure for this file, if the hash function is $h(x) = x \bmod 8$ and buckets can hold 3 records.

OR

- b) For the given schema structure

Employee (eno number(5), ename varchar(15), manager_no number(5), dept char(5))

by assuming 10 employees and 5 departments, construct the required secondary index.