


Name:			
Enrolment No:			
UPES End Semester Examination, Dec 2024			
Course: Database Systems Program: M.Tech.(CSE) Course Code: CSEG7029		Semester: I Time : 03 hrs. Max. Marks: 100	
Instructions: Do as directed.			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q. 1	Describe three schema architecture of DBMS.	4 M	CO1
Q. 2	Describe linear hashing with suitable example	4 M	CO3
Q. 3	Explain, what makes MongoDB a popular choice among NoSQL databases, and what kind of data model does it use?	4 M	CO4
Q. 4	Differentiate between centralized and distributed database management system.	4 M	CO4
Q. 5	Explain the term ETL with a suitable example.	4 M	CO5
SECTION B (4Qx10M= 40 Marks)			
Q. 6	Illustrate the use of 2 nd NF and 3 rd NF in database with a suitable example.	10M	CO2
Q. 7	Illustrate the primary types of NoSQL databases, and how does each one differ in terms of data storage?	10 M	CO3
	(OR)		
	i. Compare a collection and a document in MongoDB with suitable example. ii. Compare a single-node and a multi-node MongoDB deployment.	5 M 5 M	CO3
Q. 8	Explain the different types of distributed database systems. Explain data fragmentation, replication and allocation techniques for distributed design.	10 M	CO4
Q. 9	Illustrate slice and dice functions of OLAP with suitable example.	10 M	CO5
SECTION-C (2Qx20M=40 Marks)			
Q. 10	Describe the following in brief with suitable example. i. Referential integrity constraint ii. Compare B Tree and B+ Tree	5M* 2=10M	CO1

	<p>iii. Explain different relational algebra operators and write a relational algebra query for displaying a particular rows and particular columns of a relation.</p>	10 M	
Q. 11	<p>i. During its execution, a transaction passes through several states, until it finally commits or aborts. List all possible sequences of states through which a transaction may pass. Explain why each state transition may occur.</p> <p>ii. Consider the following two transactions:</p> <p><i>T31</i>: read(<i>A</i>); read(<i>B</i>); if <i>A</i> = 0 then <i>B</i> := <i>B</i> + 1; write (<i>B</i>).</p> <p><i>T32</i>: read(<i>B</i>); read(<i>A</i>); if <i>B</i> = 0 then <i>A</i> := <i>A</i> + 1; write (<i>A</i>).</p> <p>Add lock and unlock instructions to transactions <i>T31</i> and <i>T32</i>, so that they observe the two-phase locking protocol. Can the execution of these transactions result in a deadlock?</p>	10 M 10 M	CO2
	(OR)		
	<p>i. With the help of a neat diagram show different transaction states and explain.</p> <p>ii. Illustrate lost update problem with help of an example.</p> <p>iii. Compare recoverable and non-recoverable schedules with suitable example</p>	5 M 5 M 10 M	CO2