

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Fourth Semester**Information Technology***CS3492 - Database Management Systems****(Common to Computer Science and Engineering)***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)**

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	List the three levels of view in data abstraction.	L1	1	2
2.	Compare embedded and dynamic SQL.	L2	1	2
3.	Define functional dependency.	L1	2	2
4.	Compare lossless and lossy decomposition.	L2	2	2
5.	Define ACID property in maintaining the consistency and availability of data.	L1	3	2
6.	Compare deferred and immediate update.	L2	3	2
7.	Define data dictionary.	L1	4	2
8.	Differentiate static and dynamic hashing.	L2	4	2
9.	List the advantages of distributed databases.	L1	5	2
10.	Give an example for SQL Injection.	L2	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Illustrate the architecture of database with a neat diagram.	L2	1	8
	ii Consider the relation <i>Customers</i> (<i>CustomerID</i> , <i>FirstName</i> , <i>LastName</i> , <i>Email</i>). Write the SQL queries to	L3	1	8
	a) Create the table with following constraint CustomerID PRIMARY KEY, FirstName & LastName NOT NULL, Email UNIQUE			
	b) Insert a customer with an existing email			
	c) Insert a LastName with a null			
	Or			
b i	Elucidate on how dynamic SQL is used to write SQL queries during runtime with an example.	L2	1	8
	ii Consider the following relations.	L3	1	8
	author(author_id, first_name, last_name)			
	author_pub(author_id, pub_id, author_position)			
	book(book_id, book_title, month, year, editor)			
	pub(pub_id, title, book_id)			
	Write a relational algebra expression that returns the			
	a) names of all authors who are book editors.			
	b) names of all authors who are not book editors.			
	c) names of all authors who have at least one publication in the database.			

12. a i Explain the steps involved in converting an ER diagram to a relational model with an example. L2 2 8
- ii Draw an ER diagram for Library Management System. L3 2 8
- Or
- b i Explain the significance of Fourth Normal Form in database design with an example. L2 2 8
- ii Consider the following unnormalized relation for a Student Courses table: L3 2 8
- | Student ID | Student Name | Courses |
|------------|--------------|--------------------|
| 1 | Alice | Math, Science |
| 2 | Bob | Math, History |
| 3 | Charlie | Science, Art, Math |
- Convert the relation to first and second normal form.
13. a i Compare conflict serializability and view serializability in maintaining database consistency. L2 3 8
- ii Elucidate the concept of Two-Phase Locking protocol in ensuring the serializability. L2 3 8
- Or
- b i Explicate the detection of deadlock with the wait-for-graph. L2 3 8
- ii Explain the phases in Algorithm for Recovery and Isolation Exploiting Semantics. L2 3 8
14. a i Compare indexing and hashing in DBMS. L2 4 8
- ii Consider a B+ tree node can hold up to 4 pointers and 3 keys. Perform the following operations. L3 4 8
- a) Insert 1, 3, 5, 7, 9, 2.
- b) Delete 9,7
- Or
- b i Illustrate the query optimization in DBMS with a neat sketch. L2 4 8
- ii Consider the following relation: L3 4 8
- Salesman(salesman_id, name, city, commission)*
- Customer(customer_id, cust_name, city, grade, salesman_id)*
- write a SQL query to
- a) find the salesperson and customer who reside in the same city. Return Salesman, cust_name and city.
- b) find the salesperson(s) and the customer(s) he represents. Return Customer Name, city, Salesman, commission.
- c) find salespeople who received commissions of more than 12 percent from the company. Return Customer Name, customer city, Salesman, commission
15. a i Illustrate the distributed DBMS architecture with a neat sketch. L2 5 8
- ii Distributed systems can't simultaneously provide consistency, availability, and partition tolerance. Justify. L2 5 8
- Or
- b i Explain the role Based access control to manage security in DBMS. L2 5 8
- ii Summarize the challenges of database security. L2 5 8