

Total number of printed pages:

D/5<sup>th</sup> /DCSE501

2024

## Database Management Systems

Full Marks: 100

Time: Three hours

*The figures in the margin indicate full marks for the questions.*

*Answer any five questions.*

1.	a)	Explain Physical, Logical and View level data abstraction in details.	8
	b)	Explain mapping cardinality of entity set in details.	8
	c)	What you mean by 2 tier and 3-tier client server architecture?	4
2.	a)	Explain the concepts of super key, candidate key and primary with example.	6
	b)	Differentiate between: i. Simple and composite attribute ii. Single valued and multivalued attribute iii. Strong and weak entity set	10
	c)	What you mean by specialization and generalization?	4
3.	a)	Explain following relational algebra operations with example: Selection, Projection, Union, Cartesian product	8
	b)	Design an E-R diagram for keeping track of the exploits of your favourite sports team. You should store the matches played, the score in each match, the player in each match, and individual player statistics for each match. Summary statistics should be modelled as derived attributes.	12

4.		<p>Consider the following employee database where the primary keys are underlined. Give an expression in SQL for each of the following queries.</p> <p>Employee(<u>employee name</u>, street, city)</p> <p>Works(<u>employee name</u>, company_name, salary)</p> <p>Company(<u>company name</u>, city)</p> <p>Manages(<u>employee name</u>, manager_name)</p> <ol style="list-style-type: none"> <li>Find the name of all employees who earn highest salary.</li> <li>Find total number of employees “John” Manages.</li> <li>Find all the employees whose salary is greater than average salary of “ABC” company.</li> <li>Find all the employees who work in same city as they lives in.</li> <li>Find all the company which located in “Mumbai” and whose name start with “T”.</li> </ol>	20
5.	a)	Explain lossless decomposition with example? Define BCNF and 3NF.	10
	b)	What is the closure of the attribute set? Explain its uses.	6
	c)	What you mean by prime and non-prime attribute. Give example.	4
6	a)	What is transaction? Explain ACID properties of transaction.	8
	b)	What is view serializability? Explain it.	4
	c)	Differentiate between two phase, strict and rigorous two phase locking protocol?	8
7.	a)	Give a schedule, which is Recoverable. What you mean by cascading roll back? Give an example schedule, which is cascadless.	10
	b)	What is a deadlock? Explain some of the deadlock prevention schemes.	10