R22

Code No: R22A0504

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech II Semester Regular Examinations, June 2024

Database Management Systems

(CSE-AIML, CSE-DS & B.Tech-AIML)

Roll No										

Time: 3 hours **Max. Marks: 60**

Note: This question paper contains two parts A and B
Part A is compulsory which carries 10 marks and Answer all questions.
Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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			BCLL	CO(s)	Marks
		PART-A (10 Marks)			
		(Write all answers of this part at one place)			
1	A	How do database systems provide access to application programs?	**L2**	**CO-I**	**[1M]**
	B	Who are the users and administrators of a database system?	**L1**	**CO-I**	**[1M]**
	C	Define relational algebra and its fundamental operations.	**L1**	**CO-II**	**[1M]**
	D	What is the purpose of projection in relational algebra?	**L2**	**CO-II**	**[1M]**
	E	Describe the conditions for a relation to be in the second normal form (2NF).	**L2**	**CO-III**	**[1M]**
	F	What is Boyce-Codd's normal form (BCNF), and how does it differ from 3NF?	**L1**	**CO-III**	**[1M]**
	G	Define the transaction concept in database management.	**L1**	**CO-IV**	**[1M]**
	H	What are the possible states of a transaction?	**L1**	**CO-IV**	**[1M]**
	I	How is recovery managed in the event of a failure with the loss of non-volatile storage?	**L2**	**CO-V**	**[1M]**
	J	Explain the importance of transaction commit points in recovery	**L2**	**CO-V**	**[1M]**
		PART-B (50 Marks)			
		SECTION-I			
2	A	Discuss the applications of database systems in various domains, highlighting their significance and impact	**L3**	**CO-I**	**[5M]**
	B	Describe the process of database design, including the use of ER diagrams and the ER model with examples.	**L3**	**CO-I**	**[5M]**
		OR			
3	A	Explain the concept of data modeling, focusing on the relational model and its components such as schema, keys, and schema diagrams	**L3**	**CO-I**	**[5M]**
	B	Briefly explain the function of the query processor in a database system	**L3**	**CO-I**	**[5M]**
		SECTION-II			
4	A	Examine the basic structure of SQL queries, including the SELECT statement, FROM clause, and WHERE clause. Provide examples to illustrate the construction of SQL queries	**L3**	**CO-II**	**[5M]**
	B	Illustrate the concept of nested subqueries in SQL, discussing their syntax, execution, and applications in	**L3**	**CO-II**	**[5M]**

		complex query scenarios.			
		OR			
5	A	Explain the concept of views in SQL, including their definition, advantages, and limitations. Provide examples to illustrate the creation and usage of views.	**L3**	**CO-II**	**[5M]**
	B	Discuss the role of triggers in SQL, explaining their purpose, types, and applications in enforcing data integrity and automating database actions	**L3**	**CO-II**	**[5M]**
		SECTION-III			
6	A	Discuss the concept of normalization in database design, including its objectives and benefits, into higher normal forms, with examples.	**L3**	**CO-III**	**[5M]**
	B	Discuss the concept of join dependencies in achieving the fifth normal form (5NF), highlighting their role in preserving relationships between relations.	**L3**	**CO-III**	**[5M]**
		OR			
7	A	Analyze real-world examples of database schemas and their normalization levels, discussing the rationale behind the normalization decisions and their implications.	**L4**	**CO-III**	**[5M]**
	B	Evaluate the limitations of normalization in addressing all aspects of data modeling and database design, discussing alternative approaches for different scenarios	**L3**	**CO-III**	**[5M]**
		SECTION-IV			
8	A	Compare and contrast lock-based protocols, timestamp-based protocols, and validation-based protocols in transaction processing, discussing their advantages and limitations.	**L3**	**CO-IV**	**[5M]**
	B	Explore the concept of multiple granularities in transaction management, discussing its significance in improving concurrency and scalability.	**L3**	**CO-IV**	**[5M]**
		OR			
9	A	Explain isolation in transaction management, discussing techniques such as locking and timestamp ordering.	**L3**	**CO-IV**	**[5M]**
	B	Discuss the process of testing for serializability in transaction processing.	**L3**	**CO-IV**	**[5M]**
		SECTION-V			
10	A	Explain different log-based recovery techniques with examples	**L4**	**CO-V**	**[5M]**
	B	Discuss the effectiveness of recovery mechanisms in ensuring data consistency and reliability in modern database management systems, discussing areas for improvement.	**L3**	**CO-V**	**[5M]**
		OR			
11	A	Discuss the purpose and significance of checkpoints in recovery processes, explaining how they help reduce the time and effort required for crash recovery.	**L3**	**CO-V**	**[5M]**
	B	Analyze the impact of recovery mechanisms on database performance and availability, considering factors such as recovery time and scalability.	**L4**	**CO-V**	**[5M]**

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