BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-IV INFORMATION TECHNOLOGY : SUMMER : 2025
SUBJECT: ADVANCED DATABASE SYSTEMS

Day : Monday
Date : 02/06/2025

S-29316-2025

Time : 10:00 AM-01:00 PM
Max. Marks : 60

NB :
1. All questions are COMPULSORY.
2. Figures to the right indicate FULL marks for the question.
3. Draw neat labelled diagrams WHEREVER necessary.
4. Assume suitable data, if necessary.

Q. 1	Evaluate the role of replication and fragmentation in improving fault tolerance and performance in a distributed database system. Use any real-world scenario to support your answer.	(10)
	OR	
Q. 1	Analyze alternative database design strategies (top-down, bottom-up, mixed) and identify which is most suitable for an international retail chain. Justify your answer	(10)
Q. 2	Investigate the concept of distributed query processing to explain how a global query is decomposed and executed across multiple sites.	(10)
	OR	
Q. 2	Evaluate the effectiveness of different strategies for ordering fragment queries in a distributed system. Provide examples.	(10)
Q. 3	Appraise the objectives of parallel query optimization. How do they differ from those in a centralized system?	(10)
	OR	
Q. 3	Outline how a data skew can affect load balancing in a parallel database system. Propose strategies to mitigate the effects.	(10)
Q. 4	Appraise the effectiveness of data replication and majority voting as reliability mechanisms in distributed databases.	(10)
	OR	
Q. 4	Examine centralized and distributed deadlock detection methods and compare their strengths and limitations.	(10)
Q. 5	Assess how data mining can enhance decision-making in healthcare domains.	(10)
	OR	
Q. 5	Verify the contribution of TP-Monitors towards improving throughput in high-transaction environments.	(10)
Q. 6	Analyze the structural components and operational workflow of a typical vector database.	(10)
	OR	
Q. 6	Critique the use of traditional data systems for Big Data environments in terms of scalability and flexibility.	(10)

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