Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U1302

M.E. DEGREE EXAMINATION, NOV/DEC 2024

Computer Science and Engineering

21PCS102 –ADVANCED DATABASE TECHNOLOGY

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1.	Consider a distributed system with two sites, A and B. Can site A distinguish among the following? • B goes down. • The link between A and B goes down. • B is extremely overloaded and response time is 100 times longer than normal. What implications does your answer have for recovery in distributed systems?	CO2-App
2.	List some examples of the distributed database system.	CO1- U
3.	Assess how to write a recursive query in SQL	CO1- U
4.	What are k-d trees used for?Analyze	CO3- Ana
5.	Write a code for XML attribute and element.	CO2- App
6.	How to store XML in Database	CO1- U
7.	Assess the need for maintaining consistency in mobile application data management.	CO3- Ana
8.	Identify the properties of mobile Database.	CO1 - U
9.	List out the some cloud based databases.	CO1 - U
10.	What are the Service Model in Cloud Computing?	CO1 - U

PART B - (5 x 16 = 80 Marks)

11.	(a)	Explain the concept of Big Data and its significance in modern data management. How do Big Data storage systems differ from tradition storage systems?	CO1 - U	(16)
		Or		
	(b)	Describe the key features and advantages of distributed storage systems used in Big Data environments. How do these features address the challenges associated with storing large volumes of data?	CO1 - U	(16)
12.	(a)	Develop a concurrency control strategy for a collaborative mobile app where multiple users can edit the same document simultaneously. Describe how you would manage conflicts and ensure that changes are merged correctly without data loss.	CO2 -App	(16)
		Or		
	(b)	Design a concurrency control mechanism for a mobile database used in a real-time multiplayer game where players interact with a shared game state. How would you handle concurrent updates to the game state while ensuring a fair and consistent experience for all players?.	CO2 –App	(16)
13.	(a)	Implement a query to extract information about all employees who have completed a specific project and their associated tasks from an XML database. Use XQuery to demonstrate how you would retrieve and format this data. Explain the benefits of using XQuery for this type of querying.	CO2 -App	(16)
		Or		
	(b)	A financial institution wants to use XPath to generate a report summarizing all transactions that exceed a certain amount from an XML document. Write an XPath expression to achieve this and explain how XPath facilitates this type of query.	CO2–App	(16)
14.	(a)	A logistics company needs to optimize its delivery routes by analyzing the spatial relationships between warehouses, distribution centers, and delivery locations. Describe how you would use spatial relationships to achieve this optimization and the potential challenges you might encounter.	CO2- App	(16)
		Or		

(b) Design a spatial database schema for an environmental monitoring system that tracks air quality sensors deployed across a city. What spatial data structures would you use to efficiently store and query the spatial data generated by these sensors? How would these structures improve query performance? CO2- App (16)

15. (a) Imagine you are tasked with designing a distributed data storage system for a global e-commerce platform. How would you ensure data availability, fault tolerance, and low latency for users across different geographical locations? Describe your approach and the technologies you would use. CO2- App (16)

Or

(b) You are developing a commit protocol for a distributed database that handles high-volume financial transactions. How would you design the commit protocol to minimize latency while ensuring data consistency and fault tolerance? Discuss the trade-offs involved in your approach. CO2- App (16)