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

Day : Thursday
Date : 15/05/2025

S-29244-2025

Time : 02:30 PM-05:30 PM
Max. Marks : 60

N.B.

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data **WHEREVER** necessary.
4) Draw neat diagrams **WHEREVER** necessary.

Q. 1 Demonstrate any two binary operations out of additional relational algebra operations with example of suitable databases. Also state these additional relational algebra operational in terms of fundamental operations. **(10)**

OR

Q. 1 A travel agency maintains various Cars for rentals. The list of drivers and their license number is also maintained. A log book maintains details about tours that have taken place and are currently booked for future along with data, location and driver's name. Draw an E-R diagram for this scenario with appropriate key attributes and cardinalities with all possible attributes and entity types. Convert the E-R diagram into relational model. **(10)**

Q. 2 Articulate the three desirable design goals for relational database and exemplify each with its significance. **(10)**

OR

Q. 2 What do Armstrong's axioms signify? How do they impact on database design? **(10)**

Q. 3 Demonstrate the types of join operations implemented in SQL with examples (Note: show the relations schema assumed). **(10)**

OR

Q. 3 What are cursors? Explain its usage and attributes with syntax and example program. Differentiate between implicit and explicit cursor. **(10)**

Q. 4 Compare primary index with secondary index? Justify having two primary indices on the same relation for different search keys? What will be its advantages or disadvantages? **(10)**

OR

Q. 4 Why do "equivalence rules" are said to play a significant role during in transformation of relational expressions? How does it affect query processing? State any 6 equivalence rules. **(10)**

P.T.O.

Q. 5 Consider the transaction (T1), transaction (T2) and transaction (T3) are transactions working on data item X. Schedule explaining the execution of T1, T2 and T3 are given below. Decide whether the following schedule is view serializable or not. **(10)**

T1	T2	T3
Read (X)		
	Write (X)	
Write (X)		
		Write (X)

OR

Q. 5 What are ACID properties of transactions? Consider an example of transferring some amount from one bank account to another account. How do ACID properties apply in this case? **(10)**

Q. 6 Enlist and elaborate the types and characteristics of NoSQL databases. **(10)**

OR

Q. 6 How does access control work? What are the components of access control? Explain any two access control models with their advantages and disadvantages. **(10)**

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