

UNIT – II
RELATIONAL ALGEBRA AND CALCULUS, FORM OF BASIC SOL QUERY

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| 1 | (a) Define relational database query? | [L1][CO2] 6M |
| | (b) Illustrate GROUP by and HAVING clauses with examples? | [L3][CO2] 6M |
| 2 | (a) Illustrate different operations in Relational algebra with an example? | [L2][CO2] 6M |
| | (b) Discuss about Complex integrity constraints in SQL? | [L2][CO2] 6M |
| 3 | Classify the Relational calculus in detail? | [L2][CO2] 12M |
| 4 | (a) Define NULL VALUE? Describe the effect of null values in database? | [L1][CO2] 6M |
| | (b) Describe different types of aggregate operators with examples in SQL? | [L2][CO2] 6M |
| 5 | (a) Illustrate project, join, select and product set operators with examples. | [L2][CO2] 6M |
| | (b) Describe the SET operators with example. | [L1][CO2] 6M |
| 6 | (a) Explain the working of union, intersection and except operations? | [L2][CO2] 6M |
| | (b) Give a examples of clauses SELECT with an example. | [L2][CO2] 6M |
| 7 | (a) Distinguish between two set theoretic operations of relational algebra with an example. | [L2][CO2] 6M |
| | (b) To establish the WHERE, ANY, AS and ALL sub queries with example. | [L3][CO2] 6M |
| 8 | (a) Discuss the candidate key, primary key, super key, composite key and alternate key. | [L2][CO2] 6M |
| | Explain the following terms: | |
| | Data Redundancy and consistency | |
| | (b) Referential Integrity | |
| | Data atomicity | [L2][CO2] 6M |
| | Domain | |
| | constraints | |
| | Data models | |
| 9 | Define Join? Explain different types of joins? | [L2][CO2] 12M |
| 10 | (a) Define a nested query? | [L1][CO2] 2M |
| | (b) Write a nested query to find the names of sailors who have reserved both a red and Green boat? | [L3][CO2] 5M |
| | (c) Write a nested query to find the names of sailors who have reserved all boats? | [L3][CO2] 5M |

UNIT – III**INTRODUCTION TO SCHEMA REFINEMENT, PROPERTIES OF DECOMPOSITIONS:**

- 1 What is Normalization? Explain in detail 1NF, 2NF, 3NF, BCNF with example. [L1][CO3] 12M
- 2 Explain in detail Lossless join decomposition and dependency preserving decomposition with suitable example. [L3][CO3] 12M
- 3 (a) Differentiate BCNF with 3rd normal form. [L4][CO3] 6M
- (b) Explain about demoralization. [L2][CO3] 6M
- 4 (a) Explain the following with suitable example: [L3][CO3] 6M
(i) Non- Loss decomposition. (ii) Prime Attributes.
- (b) Illustrate redundancy and the problems that it can cause [L2][CO3] 6M
- 5 (a) Explain the following with suitable example. [L2][CO3] 6M
(i) Full functional dependency. (ii) Partial dependency.
- (b) What do you mean by Normalization? Explain BCNF, 3NF and 2NF with a suitable example. [L3][CO3] 6M
- 6 (a) What is Normalization? Explain the process of Normalization with suitable examples. [L3][CO3] 6M
- (b) Define functional and Trivial functional dependencies. [L1][CO3] 12M
- 7 Define decomposition and how does it address redundancy? Discuss the problems that may be caused by the use of decompositions? [L2][CO3] 12M
- 8 Explain about inference rules for functional dependencies and also explain about second normal form. [L2][CO3] 6M
- 9 (a) Define functional dependencies. How are primary keys related to FD's? [L1][CO3] 6M
- (b) What is redundancy? What are the problems caused by the redundancy? [L1][CO3] 12M
- 10 Explain about following normal forms [L3][CO3] 12M
- (a) Second Normal Form.
- (b) Third Normal Form.
- (c) Boyce-Codd Normal Form.

UNIT – IV**TRANSACTION AND CONCURRENCY**

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| 1 | (a) Define a Transaction? List the properties of transaction | [L1][CO4] 6M |
| | (b) Write briefly about serializability with example. | [L3][CO4] 6M |
| 2 | (a) Discuss How do you implement Atomicity and Durability | [L2][CO4] 6M |
| | (b) What is a Transaction? Explain the properties of the transaction. Explain the States of the transaction with a neat sketch. | [L3][CO4] 6M |
| 3 | (a) Discuss different phases (states) of transaction? | [L2][CO4] 6M |
| | (b) Define Schedule? What is a serial schedule? | [L1][CO4] 6M |
| 4 | (a) Demonstrate Conflict Serializability? | [L3][CO4] 6M |
| | (b) illustrate Concurrent execution of transaction with examples | [L3][CO4] 6M |
| 5 | (a) What are the states of transaction? | [L1][CO4] 6M |
| | (b) What are the two statements regarding transaction? | [L1][CO4] 6M |
| 6 | Discuss various concurrency control protocols. | [L2][CO4] 12M |
| 7 | Identify the Validation based protocols. | [L2][CO4] 12M |
| 8 | Explain ACID properties and illustrate them through examples? | [L3][CO4] 12M |
| 9 | Explain Timestamp-Based Concurrency control protocol and the modifications implemented in it. | [L3][CO4] 12M |
| 10 | Determine the deadlock and 2-phase locking to ensure serializability in concurrency control with locking methods. | [L3][CO4] 12M |

UNIT – V**RECOVERABILITY, PHYSICAL STORAGE AND DATABASE CONCEPTS**

1	(a) Discuss how do you recover from failure?	[L2][CO5]	6M
	(b) Describe about the deadlock prevention schemes.	[L2][CO5]	6M
2	(a) Write short note on Buffer management for management of data.	[L3][CO5]	6M
	(b) Explain in detail about ISAM	[L3][CO5]	6M
3	(a) Illustrate classification of storage structure	[L2][CO5]	6M
	(b) Explain concurrency control with lock based protocols	[L2][CO5]	6M
4	(a) Explain different types of locks.	[L2][CO5]	6M
	(b) Describe Times tamp based locking protocols?	[L2][CO5]	6M
5	(a) What are the storage types?	[L1][CO5]	3M
	(b) Define blocks?	[L1][CO5]	3M
	(c) What is meant by Physical blocks?	[L1][CO5]	3M
	(d) What is meant by buffer blocks?	[L1][CO5]	3M
6	(a) What are the types of storage devices?	[L1][CO5]	6M
	(b) Explain Buffer Management in concurrency control system	[L2][CO5]	6M
7	Write about the various levels of RAID with neat diagrams	[L3][CO5]	12M
8	(a) What are the factors to be taken into account when choosing a RAID level?	[L1][CO5]	6M
	(b) Distinguish between fixed length records and variable length records.	[L2][CO5]	6M
9	(a) Explain how recovery is done using undo logging and redo logging.	[L3][CO5]	6M
	(b) Which level of RAID is best? Why?	[L1][CO5]	6M
10	(a) Explain about failure with loss of non-volatile storage.	[L2][CO5]	6M
	(b) What are the methods that are used in log based recovery?	[L1][CO5]	6M

Preparedby:**1. Mr A SURESH****Associate Professor/CSE****2.MrP. SANTHOSH KUMAR****Associate Professor/CSE****3. Mr. B. Ashok****AssistantProfessor/CSE**