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**Presidency University**

**Bengaluru**

**School Of Computer Science and Engineering & Information Science**

**Summer Term End-Term Examinations, August 2024**

**Date**: 06-08-2024

**Time**: 9:30am to 12:30pm

**Max Marks**: 100

**Weightage**: 50%

**Odd Semester**: 2023 - 24

**Course Code**: CSA3023

**Course Name**: Advance Database

**Department:** SOISE

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

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| **Q.No** | **Questions** | **Marks** | **CO** | **RBT** | |
| 1 | 1. List and explain the Acid Properties of a Transaction. | 4 | CO1 | L1 | |
| 1. Explain the significance of isolation levels in transactions and describe the different types of isolation levels available in SQL. | 6 | CO1 | L2 | |
| 1. Explain the States of Transaction with an neat diagram | 10 | CO1 | L3 | |
| OR | | | | | |
| 2 | 1. Differentiate between explicit and implicit transactions. | 4 | CO1 | | L1 |
| 1. Discuss the role and implementation of locking mechanisms in transaction management. How do they help maintain data integrity | 6 | CO1 | | L2 |
| 1. Analyze the role of concurrency control in database systems, focusing on the various techniques used to ensure isolation among transactions. | 10 | CO1 | | L3 |

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| 3 | 1. Name two types of NoSQL databases and briefly describe each. | 4 | CO2 | L1 |
| 1. Explain the CAP theorem in relation to NoSQL databases. | 6 | CO2 | L2 |
| 1. Explain the different types of NoSQL databases? Give some example | 10 | CO2 | L3 |

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| 4 | 1. How do different NoSQL databases address issues such as data replication, fault tolerance, and conflict resolution? | 4 | CO2 | L1 |
| 1. Explain the Characteristics of RDBMS | 6 | CO2 | L2 |
| 1. Discuss the challenges and solutions associated with ensuring consistency and reliability in NoSQL databases. | 10 | CO2 | L3 |

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| 5 | 1. What is the difference between synchronous and asynchronous replication in distributed databases? | 4 | CO3 | L1 |
| 1. Describe the role of distributed query processing in distributed databases. | 6 | CO3 | L2 |
| 1. Explain the role of distributed database management systems (DDBMS) in handling data distribution, transaction management, and query optimization. | 10 | CO3 | L3 |

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| 6 | 1. Briefly describe the concept of eventual consistency in distributed databases. | 4 | CO3 | L1 |
| 1. Analyze the challenges of maintaining consistency in distributed databases. | 6 | CO3 | L2 |
| 1. Discuss the key differences between distributed databases and centralized databases in terms of architecture, data distribution, and fault tolerance. | 10 | CO3 | L3 |

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| 7 | 1. What is the difference between shared-nothing and shared-disk architectures in parallel databases? | 4 | CO4 | L1 |
| 1. Analyze the role of data partitioning in parallel databases. | 6 | CO4 | L2 |
| 1. Explain the concept of parallel query execution and describe the various strategies used for parallelizing database queries. | 10 | CO4 | L3 |

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| 8 | 1. How does parallel query execution improve database performance? | 4 | CO4 | L1 |
| 1. Discuss different data partitioning methods and their impact on query performance and load balancing. | 6 | CO4 | L2 |
| 1. Discuss the different architectures of parallel databases: shared-nothing, shared-disk, and shared-memory. | 10 | CO4 | L3 |

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| 9 | 1. Differentiate between explicit and implicit transactions. | 4 | CO1 | L1 |
| 1. Compare and contrast locking-based mechanisms with optimistic concurrency control methods. | 6 | CO1 | L2 |
| 1. Describe the challenges unique to distributed transactions, and how do protocols like Two-Phase Commit (2PC) and Three-Phase Commit (3PC) address these challenges? | 10 | CO1 | L3 |

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| 10 | 1. Evaluate the use of NoSQL databases in modern big data applications. | 4 | CO2 | L1 |
| 1. Give an example of a use case where a NoSQL database is more suitable than a relational database. | 6 | CO2 | L2 |
| 1. Explain the structure of ObjectID in MongoDB. | 10 | CO2 | L3 |