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**Presidency University**

**Bengaluru**

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

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

**Odd Semester**: Summer Term 2023 - 24

**Course Code**: CSE3153

**Course Name**: **Data Warehousing and Multidimensional Modelling**

**Department: CSE**

**Date**: 06-08-2024

**Time**: 01.00 PM to 04.00 PM

**Max Marks**: 100

**Weightage**: 50%

**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. Evaluate the benefits of implementing a data warehouse in an organization. | 4 | CO1 | L1 |
| 1. Discuss the role of fact tables and dimension tables in data warehousing schemas, including their design considerations and impact on query performance. | 6 | CO1 | L2 |
| 1. Elucidate the architecture of a data warehouse, incorporating detailed discussions on the staging area and data marts, and their roles within the overall framework. | 10 | CO1 | L3 |
| OR | | | | |
| 2 | 1. Explain the need of a data warehouse in contemporary business environments and how it resolves data management challenges. | 4 | CO1 | L1 |
| 1. Describe the structure, advantages, and common use cases of the star schema in data warehousing | 6 | CO1 | L2 |
| 1. Illustrate with a neat sketch the architecture of a data warehouse with a focus on the ETL process. | 10 | CO1 | L3 |

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| 3 | 1. Provide a detailed explanation of the multi-dimensional data model. | 4 | CO2 | L1 |
| 1. Outline the step-by-step process for implementing a Multi-Dimensional Data Model. | 6 | CO2 | L2 |
| 1. Describe the architecture of an Online Transaction Processing (OLTP) system and illustrate it with an appropriate diagram. | 10 | CO2 | L3 |

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| 4 | 1. List out the types of OLAP servers. | 4 | CO2 | L1 |
| 1. How do 2D and 3D multi-dimensional data models enhance understanding and analysis? Explain with an example. | 6 | CO2 | L2 |
| 1. Explain in detail with neat diagram of Hybrid OLAP (HOLAP) Server. | 10 | CO2 | L3 |

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| 5 | 1. Write short note on Cubes, Dimensions and Facts. | 4 | CO3 | L1 |
| 1. Elucidate the fundamental concepts underlying analysis and querying within a data warehouse, highlighting their key aspects and significance. | 6 | CO3 | L2 |
| 1. Provide a detailed explanation of the roll-up and drill-down operations, including illustrative examples to clarify their functions and applications. | 10 | CO3 | L3 |

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| 6 | 1. Provide an in-depth explanation of relational representations within the context of data warehouses. | 4 | CO3 | L1 |
| 1. Describe slice and dice in detail using an example. | 6 | CO3 | L2 |
| 1. Explain the different types of Slowly Changing Dimensions (SCDs) and give an example of each. | 10 | CO3 | L3 |

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| 7 | 1. Describe the concept of a materialized view and explain its benefits in a data warehouse environment. | 4 | CO4 | L1 |
| 1. Explain what bitmap slices are, including their definition and structure. | 6 | CO4 | L2 |
| 1. Provide a comprehensive overview of the Extract-Transform-Load (ETL) process. Discuss each phase in detail, including data extraction, transformation, and loading. | 10 | CO4 | L3 |

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| 8 | 1. Give an overview of database indexing and discuss its role in improving query performance. | 4 | CO4 | L1 |
| 1. Describe the concept of join indices and their role in optimizing complex queries. | 6 | CO4 | L2 |
| 1. Discuss the relationship between indexing and query performance in detail. | 10 | CO4 | L3 |

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| 9 | 1. Compare and contrast the primary differences between a database and a data warehouse in terms of structure and usage. | 4 | CO1 | L1 |
| 1. Explain the snowflake schema with an example. | 6 | CO1 | L2 |
| 1. Explain the key characteristics of data warehouses, focusing on how each characteristic addresses specific data management needs. | 10 | CO1 | L3 |

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| 10 | 1. Describe the features of multidimensional data models. | 4 | CO2 | L1 |
| 1. Enumerate and critically analyze the advantages and disadvantages associated with the multi-dimensional data model. | 6 | CO2 | L2 |
| 1. Differentiate between OLAP Versus OLTP with identified parameters. | 10 | CO2 | L3 |