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University Examinations 2023/2024

**SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE IN DATA SCIENCE**

CDS 3250: DATA WAREHOUSING FOR ANALYTICS

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS: *Answer question **one** and any other **two** questions*

QUESTION ONE (30 MARKS)

- a) Explain the difference between OLTP and OLAP systems. How does a data warehouse bridge the gap between them? (4 marks)
- b) Differentiate between Data mart and Enterprise Data Warehouse. (4 marks)
- c) Give any 3 reasons why an organization should implement a Data Warehouse for analysis. (3 marks)
- d) What are the key components of a data warehouse architecture? Provide a brief overview of each component. (5 marks)
- e) Discuss the benefits and challenges associated with dimensional modeling in data warehousing. (4 marks)
- f) How does data modeling in data warehousing differ between traditional relational databases? (4 marks)



MUST is ISO 9001:2015 and



ISO/IEC 27001:2013 CERTIFIED

- g) Describe the purpose of following as used in Data Warehousing. (6 marks)
- i. Surrogate key
 - ii. Bus matrix
 - iii. Grain

QUESTION TWO (20 MARKS)

- a) Use a diagram to differentiate between Kimball vs Inmon Data warehouse architecture. (6 marks)
- b) Explain the concept of slowly changing dimensions (SCD) and provide examples of each type. (4 marks)
- c) Compare and contrast star schema and snowflake schema. (4 marks)
- d) Identify an organization of your choice and design the data warehouse using Dimensional Modeling. (6 marks)

QUESTION THREE (20 MARKS)

- a) Compare and contrast different approaches to data extraction from heterogeneous sources. (4 marks)
- b) Taking Transport as a business environment, model the business process using BPMN or UML or text. (6 marks)
- c) Demonstrate the use of dimensional modeling to design a data warehouse in Order management environment. (6 marks)
- d) Evaluate the use of the following Logical modeling operations used in Data Ware housing. (4 marks)
- i) Projection,
 - ii) Cube join



QUESTION FOUR (20 MARKS)

- a) Elaborate the processes involved in the following when Extracting, Transforming and Loading data to a data warehouse. (6 marks)
- i) Extract
 - ii) Transformation
 - iii) Loading
- b) Evaluate the type of data that should be stored in a data warehouse taking into consideration the aspect of data analysis. (6 marks)
- c) Differentiate between the following. (4 marks)
- i) Periodic snapshot and accumulative snapshot
 - ii) Expiration and effective dates
- d) Use a diagram to indicate a multi dimension cube indicating slicing of the cube. (4 marks)

QUESTION FIVE (20 MARKS)

- a) Compare and contrast different approaches to data extraction from heterogeneous sources. (4 marks)
- b) Differentiate incremental loading and full loading giving an advantage in each case. (4 marks)
- c) Illustrate any 3 best practices for transforming data during the ETL process? How can data quality be ensured? (6 marks)
- d) Identify an area of your choice in an organization that will require analysis of historical data for the purpose of decision making. Use a diagram to show a fact table and dimension tables representing the organization's dimensional model. (6 marks)

