



# TECHNICAL UNIVERSITY OF MOMBASA

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FOET

COMPUTING AND INFORMATICS

## UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

**EIT 4415: INTRODUCTION TO DATA WAREHOUSING**

**END OF SEMESTER EXAMINATION**

**SERIES:**2016/2017

**TIME:**2 HOURS

**DATE:**Pick DateSelect MonthPick Year

### Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No questions. Answer Question one(Compulsory) and any other two questions.

**Do not write on the question paper.**

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### QUESTION ONE

- a) State your understanding of the following terms in the context of data warehousing
- i) Data warehousing
  - ii) Business Intelligence
  - iii) Dimension Table
  - iv) Fact Table
  - v) Roll-up
- [Marks 10]**
- b) State FOUR main stages of data warehousing
- [Marks 4]**
- i) Describe each of the listed activities in question (b) above and use a diagram to illustrate your description outlining the various stages
- [Marks 8]**

- c) Explain the functions of the following parts of the warehouse architecture
  - i) Operational Data Sources
  - ii) Operational Data Store (ODS)
  - iii) Load Manager **[Marks 6]**
- d) Describe TWO characteristics of a data mart **[Marks 2]**

### **QUESTION TWO**

- a) Describe the following terms OLTP and OLAP **[Marks 4]**
  - i) State FOUR differences between OLAP and OLTP **[Marks 8]**
- b) Explain the difference between metadata and data dictionary and give an example where possible **[Marks 5]**
- c) List the different types of data ware housing **[Marks 3]**

### **QUESTION THREE**

- a) Explain the following terms in relation to OLAP Operations in the Multidimensional Data Model.
  - i) Drill-down
  - ii) Slice and dice
  - iii) Pivot **[Marks 8]**
- b) Technical University of Mombasa has appointed you to be the lead person in the institution data management and security. To ensure availability, integrity and security of the database and data warehouse of the institution.
  - i) Outline the four sources of security threat to the data sources of the institution **[Marks 4]**
  - ii) In OLAP Systems, sensitive data can be inferred from answers to legitimate queries. Describe the two kind of inference **[Marks 6]**
  - iii) State the Security solution for OLAP systems **[Marks 2]**

### **QUESTION FOUR**

- a) The database component of a data warehouse is described using a technique called dimensionality modeling: "A logical design technique that aims to present the data in a standard, intuitive form that allows for high-performance access"  
Dimensionality modeling uses the concepts of Entity-Relationship (ER) modeling with some important restrictions. Describe the following models with assistance of appropriate diagrams:
  - i) Snowflake schema
  - ii) Star schema **[Marks 8]**
- b) Clearly outline four advantages of dimensional models **[Marks 8]**
- c) State two drawbacks of two tier security architecture in OLAP **[Marks 4]**

**QUESTION FIVE**

- a) State any FIVE business benefits of a data warehouse to an institution or enterprise? **[Marks 10]**
- b) Describe the various steps to building a data warehouse **[Marks 10]**