

UGANDA COARTYRS UNIVERSITY
FACULTY OF SCIENCES
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION
SYSTEMS

END OF SEMESTER FINAL EXAM

SEMESTER I, 2021/22

**THIRD YEAR EXAMS FOR Bsc. IT, GEN & CS LUBAGA, KNOZI &
MASAKA**

BUSINESS INTELLIGENCE AND DATA WAREHOUSING
CSC 3101

DATE: 28TH JAN, 2022

TIME: 09:30-12:30 PM

TIME: 3 HRS

INSTRUCTIONS:

- 1. ATTEMPT ALL QUESTIONS IN SECTION A (40 MARKS)**
 - 2. ATTEMPT THREE (03) QUESTIONS IN SECTION B (60 MARKS)**
 - 3. DO NOT OPEN THIS EXAM UNTIL YOU ARE TOLD TO DO SO**
 - 4. ALL ROUGH WORK SHOULD BE IN YOUR ANSWER BOOKLET**
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SECTION A [40 MARKS]

Given that Lwanyama digital investments has contacted has decided to adopt business intelligence systems to improve their decision making aspect. As the head, department of business intelligence and data ware housing in the organizations, provide to your team solutions to the following queries.

- a) Imagine the team has decided to develop a fact constellation to represent both product sales and delivery, design an information package representing the dimensions, attributes, hierarchies and measured facts. [6 Mks]
- b) From the package in a) above design a fact constellation model (galaxy schema) [6 Mks]
- c) Identify the three main approaches that could be used in integrating predictive insight into a Business Intelligence application [3 Mks]
- d) Discuss any two examples showing applications of Data Mining Integrated with Business Intelligence [2 Mks]
- e) Using an example in each explain the difference between business intelligence (BI) and artificial intelligence [2 Mks]
- f) In your opinion what is data mining (DM) as used in business intelligence. Use an example to support your answer [3 Mks]
- g) Identify any two problems that could be faced in the business case above in data integration and consolidation [2 Mks]
- h) Explain any four modes of applying data to a dimension table in a data warehouse [4 Mks]
- i) Differentiate between the two categories of data found in operational business systems [2 Mks]
- j) In your opinion, explain three broad functional categories of ETL tools [3 Mks]
- k) With an example, explain the concept of 'clean as you go method' as using in ETL [3 Mks]
- l) Based on your knowledge on business intelligence, explain four types of users found in a data warehouse [4 Mks]

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SECTION B [60 MARKS]

QUESTION ONE

- a) From your experience in data warehousing, discuss any five (5) differences between OLAP and Data mining techniques [5 Mks]
- b) With use of a well-labeled diagram illustrate the Architecture of MOLAP Model [5 Mks]
- c) With examples explain the differences between MOLAP and ROLAP as used in data warehousing [4 Mks]
- d) Differentiate between the following: (i) Drill down and roll up, (ii) Slice and dice [4 Mks]
- e) Based on your knowledge in business intelligence, Differentiate between Verification mode and Discovery mode [2 Mks]

QUESTION TWO

- a) In your opinion, justify why is it important to back up a data warehouse? Explain what a data warehouse backup strategy contains [6 Mks]
- b) Using a diagram illustrate the business intelligence architecture [4 Mks]
- c) Explain the three types of complexities (errors) that could be encountered during the developing a data warehouse [3 Mks]
- d) Using a simple well labeled diagram illustrate the basic elements of a data warehouse environment that should be considered in data warehousing [4 Mks]
- e) With examples discuss any three types of metadata that could be used in meta data analysis for a given data warehouse [3 Mks]

QUESTION THREE

- a) Using illustration discuss the two types of Datamarts that any data warehouse implementation team can consider [4 Mks]
- b) With examples, discuss any four Methods of information delivery from a business intelligence tool [4 Mks]
- c) In your opinion, describe the reasons of not feeding data directly from source operation systems into an OLAP system [4 Mks]

- d) Many studies have identified techniques which could be used in data mining. With examples, discuss any four techniques used in mining of information [4 Mks]
- e) Based on your knowledge in business intelligence, discuss the emerging trends in business intelligence and data warehousing [4 Mks]

QUESTION FOUR

- a) With the use of a well labeled illustration, discuss the steps in sequence that should be followed during the KDD process [5 Mks]
- b) Using examples discuss any five data mining models that could be used in the process of pattern discovery in any organisation [5 Mks]
- c) With an example discuss the concept of overfitting as used in data mining [3 Mks]
- d) Describe the major steps in the ETL process [4 Mks]
- e) ETL functions are primarily challenging, time consuming and tedious because of the nature of the source systems. Account for these challenges [3 Mks]

QUESTION FIVE

- a) As the head business intelligence department in Lwanyama digital investments, advise the data mining team on any five common classes of data mining tasks that could be employed. Use relevant examples for each task [5 Mks]
- b) Explain with examples any five data pilot projects which could be used in the data mart pilot project for the project in the case study [5 Mks]
- c) With examples, discuss any four data extraction techniques used in the extraction phase of ETL [4 Mks]
- d) Given that table staff has *sid* as a primary key and table department has *did* as a primary key. Write an SQL statement that would add a foreign key constraint of *did* in the students table [2 Mks]
- e) With examples, discuss any four data transformation types that could be considered in the project above [4 Mks]

**END
SUCCESS**