MANICALAND STATE UNIVERSITY OF APPLIED SCIENCES

FACULTY OF ENGINEERING, APPLIED SCIENCES AND TECHNOLOGY

DEPARTMENT: COMPUTER SCIENCE AND INFORMATION SYSTEMS

MODULE: BUSINESS INTELLIGENCE AND DATA ANALYTICS

CODE: INSY421

SESSIONAL EXAMINATIONS
APRIL 2024

DURATION: 3 HOURS

EXAMINER: MS G. MUTIPFORO

INSTRUCTIONS

1. *Answer **all questions** in **Section A***
2. *Answer **any three (3)** questions in **Section B**.*
3. *Start a new question on a fresh page*
4. *Total marks 100*

SECTION A

Question 1

a) There are six transactions in total with various different purchases that happened in your cafeteria.

Transaction (TID)	Item Basket
TID1	Cookie, chocolate, ice cream, cake
TID2	Cookie, chocolate, cream bun
TID3	Chips, burger
TID4	Bread, egg, tomato
TID5	Pizza, burger
TID6	Cookie, chocolate, cake

You are required to calculate: [please show all workings]

i) Support (cookie); **[2 Marks]**

ii) Support (cookie, cake); **[3 Marks]**

iii) Confidence of {cookie -> cake}; and **[3 Marks]**

iv) Lift of (cookie -> cake). **[4 Marks]**

b) Using suitable examples, describe the various types of decisions according to their nature. **[10 Marks]**

c) Describe web mining. List and explain any three methods of web mining. **[10 Marks]**

d) The ETL process is a fundamental principle in BI. Illustrate and give an account of its importance. **[8 Marks]**

SECTION B:

Question 2

a) Evaluate the different types of business intelligence reports. **[10 Marks]**

b) Highlight on the characteristics of a data warehouse. **[10 Marks]**

Question 3

a) With the aid of a diagram describe the four major components of BI and the relationship that exit among them. **[12 Marks]**

b) Decision support systems can be classified in different categories. Outline and describe any two (2) of these classifications. **[8 Marks]**

Question 4

a) Explain any three OLAP operations that you familiar with. **[9 Marks]**

a) b) Consider the Apriori principle encoded in the algorithm in listing 3.1 below:

```
Ck: Candidate itemset of size k
Lk: frequent item set of size k
L1={frequent items};
For (k=1; Lk!={}; k++) do begin
        Ck+1=candidates generated from Lk;
        For each transaction t in database do
                Increment the count of all candidates in
                Ck+1 that are contained in t
        Lk+1= candidates in Ck+1 with min_support
        End
Return Unionk of Lk
```

Listing 3.1

Describe using a suitable example how the algorithm is deployed in data

mining. **[11 Marks]**

Question 5

a) Using suitable examples explain any four (4) decision making models you are familiar with. **[16 Marks]**

b) **Classification** and **regression** are **predictive data mining functionalities** that are used to build models that can be used to predict future outcomes or events. Describe these two functionalities and give their areas of application in business. **[4 Marks]**

END OF EXAMINATION