



**DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY**

University Examinations 2014/2015

**SECOND YEAR SEMESTER II EXAMINATION FOR THE DEGREE OF  
BACHELOR OF CRIMINOLOGY AND SECURITY STUDIES**

**BSM2419: DATA MINING**

**DATE: 4<sup>TH</sup> SEPTEMBER 2015**

**TIME: 8.30AM – 10.30AM**

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*Instructions: Answer Question 1 and Any Other Two.*

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**QUESTION ONE**

- a) Distinguish the following
  - i. Data mining and Knowledge Discovery in Databases
  - ii. Clustering vs Classification
  - iii. Descriptive Data Mining vs Prescriptive Data Mining (6 Marks)
- b) Describe the steps involved in data mining when viewed as a process of knowledge discovery. (6 Marks)
- c) Discuss three ways in which data mining can aid crime investigations for Juvenile abuse cases (6 Marks)
- d) Describe four tools and techniques that can be applied in data mining for pre-crime and post-crime investigation. (8 Marks)
- e) With the aid of a diagram describe the data mining architecture. (4 Marks)

**QUESTION TWO**

- a) State and explain five sources of data to be mined for fraud detection. (10 marks)
- b) Enumerate three classes of schemas that are popularly used for modeling data warehouses. (3 marks)
- c) Discuss the major components of a data warehouse. (7 Marks)

### **QUESTION THREE**

- a) Briefly describe the following *advanced database systems* and applications:
- i. spatial databases,
  - ii. multimedia databases,
  - iii. The World Wide Web. (6 Marks)
- b) The Two Crows process model involves a list steps essential for successful data mining. Discuss the basic steps defined by this model. (14 Marks)

### **QUESTION FOUR**

- a) Highlight four issues in data mining. (4 marks)
- b) In real-world data, tuples with missing values for some attributes are a common occurrence. Describe various methods for handling this problem. (4 Marks)
- c) Explain any three data mining algorithms used to mine data. (6 Marks)
- d) Explain how the following functionalities are used in data mining
- i. Classification
  - ii. Associate analysis
  - iii. Outlier analysis. (6 Marks)

### **QUESTION FIVE**

- a) Distinguish the following in relation to data warehouses
- i. Operational data store and data mart
  - ii. Indexes and views
  - iii. Unit testing and system testing (6 Marks)
- b) Explain three benefits of OLAP (6 Marks)
- c) Discuss four motivations of crime that can be explored in a data mining exercise to solve a criminal incident (8 Marks)