



**FACULTY OF ENGINEERING AND THE ENVIRONMENT**

**DEPARTMENT OF MINING ENGINEERING**

**COMPUTER APPLICATIONS IN MINING**

**EMI 2203**

**Final Examination Paper**

**August 2021**

This examination paper consists of 3 pages

**Time Allowed: 3 hours**

**Total Marks: 100**

**Examiner's Name: Mr D Runganga**

**INSTRUCTIONS**

1. This question paper consists of 5 questions, **YOU MUST ANSWER ANY FOUR QUESTIONS.**
2. Each question carries 25 marks
3. Answer each question on a new page and write as eligible as possible

**MARK ALLOCATION**

<b>Question 1 to 5</b>	<b>25Marks</b>
<b>Part Questions</b>	<b>As shown in each part question</b>
<b>Total Attainable</b>	<b>100</b>

**QUESTION 1**

- a. Briefly describe what you understand from the following tables of a geological database used in GEOVIA Surpac.
- i. Collar [3]
  - ii. Survey [3]
  - iii. Translational [3]
  - iv. Assay [3]
  - v. Geology Styles [3]
- b. Outline the steps for creating a database in GEOVIA Surpac. [10]

**QUESTION 2**

- a. Outline the steps of Importing and Auditing Data in GEOVIA Surpac [10]
- b. Using a practical example and diagram, outline the steps clearly showing how you would draw a polygon using a Line Tool in AutoCad 2016 [10]
- c. State the shortcut for performing the following tasks in AutoCad 2016
- i. Bring the text window on the screen. [1]
  - ii. Toggle between Isoplanes. [1]
  - iii. Toggle dynamic UCS. [1]
  - iv. Select everything on screen. [1]
  - v. Call the copy Command [1]

**QUESTION 3**

- a. Briefly describe what you understand from the following terms as used in computer applications in mining
- i. Data-centric [2]
  - ii. Sampling unit [2]
  - iii. Function centric [2]
  - iv. Block model [2]
  - v. String file [2]
- b. List the **SIX** contents of an active database [6]

- c. What are the components of string file? [2]
- d. Data in a string file is classified into Three categories. What are the categories? [3]
- e. Give any mining software that may be used in the following mining departments
  - i. Ventilation [1]
  - ii. Loading and hauling [1]
  - iii. Fragmentation analysis [1]
  - iv. Scheduling [1]

#### QUESTION 4

The use of softwares to optimize fragmentation in drilling and blasting operations has become a common phenomenon in the mining industry. There has been an upsurge in the creation of these softwares, some operational on computers and even on mobile phones. The general application of these software is to enable fragmentation analysis, drill and blast design etc. It is however not an easy task for most mining organizations to choose from such a large pool of commercialized applications.

- a. Analyze the use of any **TWO** drill, blast and fragmentation analysis softwares of your choice accounting for software applicability, cost, user-friendliness, performance and other critical areas [16]
- b. Outline the advantages of using the following mine planning software
  - i. Surpac [6]
  - ii. Vulcan [3]

#### QUESTION 5

- a. Evaluate the use of Excel for mine planning and scheduling purposes. In your analysis, clearly highlight its applicability, strengths and shortfalls in manipulating data throughout the life of a mine. [13]
- b. Gantt Charts are important for project planning. Evaluate the use of Gantt charts as a project management tool for large scale mining operations. [8]
- c. Briefly describe what you understand from the term “geological database” [4]