



FACULTY OF ENGINEERING AND THE ENVIRONMENT

DEPARTMENT OF MINING ENGINEERING

COMPUTER APPLICATION IN MINING

EMI 2202

Final Examination Paper

January 2021

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: Eng Murewa B Zvigumbu

INSTRUCTIONS

1. Answer **all** questions.
2. Each question carries **20 marks** each.

Additional Requirements

Calculator
Graph paper

MARK ALLOCATION

Questions	Marks
Question 1	20
Question 2	20
Question 3	20
Question 4	20
Question 5	20
Total Attainable	100

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Question 1: Graphical Display using Computer Aided Design software's.

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A bank wishes to analyse the *value* of saving account balances against a *number of saving accounts*. A sample of 64 clients who are bank clients are drawn from employees of Epoch Mine. The value and number of saving account are categorical frequency table in Table Q1 (a) below

Table 1(a): Customer Complaints.

Saving	Frequency		Ogive	
	# Savers	Total Savings	% of Savers	Total % of Savers
Below 0	0	0	0	0
0 - 500	12	4 089	19	4
500 - 1 000	18	14 022	47	18
1 000 - 3 000	25	35 750	86	53
3 000 - 5000	6	24 600	95	78
5 000 - 10 000	3	22 542	100	100
Total	64	101003		

Construct a *Lorenzo curve* of using the information given in the table above. **[20 Marks]**

Question 2: Robotics and Automation in Mining

“The deterioration of mining conditions, the rising cost of labor, the limited potential of both humans and traditional mining machines and the lack of skilled workers are some of the reasons to consider robots in mining.” Adapted by an article by Vladimir Konyukh written for Mineral Resources Engineering Journal; Volume 2 (2002).

Discuss with relevant case studies the application of Robotics and Automation in Mines. **[20 Marks]**

Question 3: AutoCAD

Discuss the advantages of using mine planning and design software over the manual planning and design methods. **[20 Marks]**

Question 4: Databases Microsoft Access.

Discuss the role of Enterprise Resource Planning (ERP) in any mining organisation of your choice. **[20 Marks]**

Question 5: Surpac Mining Design Software

- a. Describe the following terms as used in mine application software;
 - i. Point. **[1 Marks]**
 - ii. String. **[1 Marks]**
 - iii. Digital terrain mode (DTM) **[1 Marks]**
 - iv. Ventilation Database **[1 Marks]**
 - v. Survey Database **[1 Marks]**
 - vi. Block model **[1 Marks]**
 - vii. Macros **[2 Marks]**
 - viii. Plot files **[2 Marks]**
 - ix. Plugins **[2 Marks]**
- b. Differentiate between function centric and data centric operations **[4 Marks]**
- c. Describe the difference between Digital terrain mode (DTM) surfaces and three dimensional solid models. **[2 Marks]**
- d. Distinguish between Break line strings and spot height strings used in modelling of DTM surfaces. **[2 Marks]**

***** **THE END** *****