FACULTY OF ENGINEERING AND THE ENVIRONMENT

DEPARTMENT OF MINING ENGINEERING

MINING METHODS

EMI 2205

Final Examination Paper

August 2021

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: Mr D. Chawira

INSTRUCTIONS

1. This paper contains One section with Five questions
2. Answer Question One (25 marks) and any other **Three** questions (25 marks each)
3. Where a question contains subdivisions, the mark value of each subdivision is shown in brackets.
4. Start each question on a new page

NB: DO NOT TURN OVER THE QUESTION PAPER OR COMMENCE WRITING UNTIL INSTRUCTED TO DO SO

Additional Requirements

Non-Programmable Calculator

MARK ALLOCATION

Question 1 to 5	**25Marks**
Part Questions	**As shown in each part question**
Total Attainable	**100**

Question 1 (25 marks)

a. Mine X has tasked you as the project engineer to do a feasibility study on a recent discovered orebody. Describe and explain the factors that would affect the choice of a mining method.

[12 marks]

b. Explain the **FOUR** critical design issues when adopting the open pit mining method.

[8 marks]

c. What are the issues that have to be considered before combining a surface mining operation and an underground mining method on the same area **[5 marks]**

Question 2 (25 marks)

a. With the aid of diagrams, briefly explain the difference between open pit mining and open cast mining. **[6 marks]**

b. Describe sublevel open stoping mining with special reference to:

1. Application **[5 marks]**
2. Development **[5 marks]**
3. Production **[5 marks]**
4. Ore handling **[4 marks]**

Question 3 (25 marks)

a. Explain briefly with the aid of diagrams, development mining and production mining as applied to underground mining operations. **[12 marks]**

b. Compare and contrast overhand and underhand stoping mining method. **[8 marks]**

c. What orebody geometric and rock features are necessary for the adoption of sublevel caving mining method? **[5 marks]**

Question 4 (25 marks)

a. With the aid of sketches, explain the difference between open pit mining and open cast mining as applied in coal mining. **[9 marks]**

b. Describe Stope and Retreat vs. Stope and Fill as applied in underground gold mining.

[8 marks]

c. Explain the difference between bulk mining methods and selective mining methods giving examples as applied in mining. **[8 marks]**

Question 5 (25 marks)

a. Pit optimisation is a skill that planning engineers have to master if they are to be termed competent.

i. State the **THREE** common open pit optimisation methods used. **[3 marks]**

ii. Compare **TWO** different open pit optimisation methods of your choice as applied in gold mining. **[10 marks]**

c. In underground mining there are three primary accesses to the deposit. Briefly describe these **THREE** primary accesses to the deposit giving reference to their respective advantages and disadvantages. **[12 marks]**