



FACULTY OF ENGINEERING AND THE ENVIRONMENT

DEPARTMENT OF MINING ENGINEERING

MINING GEOLOGY

EMN 2207

SUPPLEMENTARY EXAMINATION PAPER

SEPTEMBER 2025

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: Mr. N Ndlovu

INSTRUCTIONS

1. This paper contains **ONE** section with **SIX** questions.
2. Answer **QUESTION ONE** and **any other THREE** questions.
3. Each question **carries 25 marks**.
4. Where a question contains subdivisions, the mark value of each subdivision is shown in brackets.
5. Illustrate your answer, where appropriate, with large clearly labelled diagrams.
6. Start each question on a new page.

Additional Requirements

None

MARK ALLOCATION

Question 1 to 6	25Marks
Part Questions	As shown in each part question
Total Attainable	100

Question 1

- a. Mining Geology intertwines with many other disciplines for production in the Mine Value Chain. Discuss these disciplines and the role of mining geology as well as the relevance of mining geology to mining engineers. [12]
- b. With the aid of a named ore and mineral of interest thereof, discuss the genesis, typical extraction and associated ores in a geological context. [13]

Question 2: Petrology (25 marks)

- a. Name and discuss two textures of igneous rocks and how the textures influence mineralogy. [4]
- b. Define the process of formation of sedimentary rocks and basis of classification. Further describe the sedimentary rocks **Sandstone and Limestone** with examples of mineral deposits hosted by them. [16]
- c. Elucidate on the different types of plate boundaries and the geological features they create? Use diagrams where possible. [5]

Question 3: Ore depositional textures and Mineralogy (25 marks)

- a. What are the two considerations for factors that govern wall rock alteration? Elucidate on the different aspects of the two considerations. [8]
- b. List and explain the four main groups that conform to deposition from external processes. [8]
- c. A MINERAL is a *naturally occurring, homogeneous solid, with a definite (not fixed) chemical composition*, and a *highly ordered atomic arrangement* usually *formed by inorganic processes*.
Guided by examples, explain the bold and italic terms in the above definition. [9]

Question 4: Ores and Resources (25 marks)

- a. Describe in brief, the origin, formation , mode of occurrence, and the distribution of coal in Zimbabwe. [15]
- b. Discuss the different kinds of magmas associated with igneous rocks and ores that form thereof. [10]

Question 5: Ore Deposit geology (25 marks)

- a. Describe placer deposits? Explain how they form and include examples of minerals found in such environments [6]
- b. Explain the sources of hydrothermal fluids which aid in the concentration of minerals. [8]
- c. Explain how a mineral such as chromium is emplaced on the rocks. Give typical names of rocks associated with chromium. [5]
- d. Elucidate on the origin, mineralogy and occurrence of carbonatites. [6]

Question 6: Exploration geology (25 marks)

Enumerate on 5 different methods of geophysical exploration incorporating the principle, equipment and ideal minerals under exploration. [25]