



FACULTY OF ENGINEERING AND ENVIRONMENT

DEPARTMENT OF MINING ENGINEERING

INTRODUCTION TO MINERALS INDUSTRY

EMN 1207

Final Examination Paper

APRIL 2024

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: MS C MACHADU

INSTRUCTIONS

- 1. Answer ALL FOUR (4) questions**
- 2. Each question carries 25 marks**

Additional Requirements

None

MARK ALLOCATION

Question 1 to 4	Total 25 marks each
Part Questions	As shown in each part question
Total Attainable	100 marks

ANSWER ALL FOUR QUESTIONS

QUESTION 1

(a) Distinguish between:

(i) Mining and mining engineering [2]

(ii) Mineral and Ore [2]

(iii) Resource and reserve (draw the diagram and include the different categories of resources and reserves in your answer) [7]

(b) Briefly describe open pit mining, include operations and equipment used. Draw and label components of an open pit. [14]

QUESTION 2

a) Explain the concept of ore grade and discuss its importance in mining operations. Provide an illustration to depict high-grade and low-grade ores. [8]

b) Discuss the principles and applications of mineral processing, including crushing, grinding, and flotation, in the extraction of valuable minerals from ores. [12]

c) Define “refining” with regards to pyro-metallurgy and list any 3 of the refining methods employed. [5]

QUESTION 3

- a) Briefly explain the concept of metallurgy and discuss the different stages involved in the metallurgical process, from ore extraction to the production of metal. Include a flow chart showing the stages. **[10]**
- b) Describe the process of mineral exploration and discuss the techniques used to identify potential mineral deposits. **[15]**

QUESTION 4

- a) Differentiate between drill patterns and blast design. **[2]**
- b) List the 3 drill patterns and 3 blast designs employed in surface mines. **[6]**
- c) Outline the difference between Bank Cubic Metres (BCM) and Loose Cubic Metres (LCM) and briefly explain how the 2 are interrelated. **[5]**
- d) Briefly describe the following underground coal mining methods with the aid of a diagram:
- e) Longwall mining **[6]**
- f) Room (board) and pillar mining **[6]**

END OF EXAMINATION