



FACULTY OF ENGINEERING AND ENVIRONMENT

DEPARTMENT OF MINING ENGINEERING

INTRODUCTION TO MINERALS INDUSTRY

EMI 1207

Final Examination Paper

JUNE 2023

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: MS C MACHADU

INSTRUCTIONS

1. Answer ALL TWO (2) questions from section A and any TWO (2) questions from section B
2. Each question carries 25 marks

Additional Requirements

None

MARK ALLOCATION

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

SECTION A: ANSWER ALL TWO QUESTIONS

QUESTION 1

(a) Distinguish between:

(i) Mining and mining engineering [2]

(ii) Mineral and Ore [2]

(iii) Resource and reserve (**Hint:** include the different categories of resources and reserves in your answer) [6]

(b) Briefly describe open pit mining, include operations and equipment used. Draw and label components of an open it. [15]

QUESTION 2

a) What is beneficiation? [2]

b) What is pyro-metallurgy and state 3 of its advantages? [6]

c) What is hydrometallurgy? [3]

d) List any 4 specialized roasters used in pyro-metallurgy. [4]

e) Define “refining” with regards to pyro-metallurgy and list the 3 types of refining methods used. [5]

f) What are the 5 common separating methods used in ore dressing and write short notes for each. [5]

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION 3

- (a)** Define Metallurgy [1]
- (b)** Can you briefly describe any three main groups of metallurgy [12]
- (c)** Define mineral ore processing and briefly describe the unit operations involved [12]

QUESTION 4

- a)** List the 3 blast designs used in surface mines. [3]
- b)** List the 3 different types of stripping ratios. [3]
- c)** Outline the difference between Bank Cubic Metres (BCM) and Loose Cubic Metres (LCM) and briefly explain how the 2 are interrelated. [6]
- 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]
 - g)** What is a mine? [1]

QUESTION 5

- a)** State 3 reasons why drilling is performed and give examples. [6]
- b)** List the 2 types of explosives commonly used in mining. [3]
- c)** Write short notes on the following:
 - i.** Heap Leaching [5]
 - ii.** Vat leaching [5]
 - iii.** In-situ Leaching [5]
- d)** When do you consider employing underground mining methods? [2]

END OF EXAMINATION