



FACULTY OF ENGINEERING AND THE ENVIRONMENT

DEPARTMENT OF MINING ENGINEERING

COMPUTERISED MINE DESIGN EMI 3202

Final Examination Paper

June 2023

This examination paper consists of 2 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: Mr K. Kondo

INSTRUCTIONS

1. This paper contains **ONE** section with **FIVE** 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 5	25 Marks
Part Questions	As shown in each part question
Total Attainable	100

Question 1

You have been asked to develop a life-of-mine plan for a greenfield project at New Font open pit mine in Perth, Australia. The majority of this task heavily depends on you carrying out an optimal ultimate pit design.

- 1.1. Describe the steps that you will follow to determine the final pit design. [12 marks]
- 1.2. Describe and explain any three ways of reducing the overall strip ratio of your design.[9 marks]
- 1.3. Briefly explain two major advantages of using the top-down approach over the bottom-up approach in pit design. [4 marks]

Question 2

- 2.1. Using a simple diagram, briefly explain how the partial percentage function minimises inaccuracies of block model volumes and tonnages. [10 marks]
- 2.2. Describe the necessary steps of determining reserve tonnages and grades by elevation ranges, through making use of the block model report function. [15 marks]

Question 3

- 3.1. Describe in detail how one main level of a sub-level stopping mine is designed from the collar of a vertical shaft access down to the production stopes. [25 marks]

Question 4

- 4.1. Define computer aided design and explain fundamental reasons for implementing a computer aided design. [7]
- 4.2. Explain the design process in computer aided design. [8]
- 4.3. Explain benefits of a computer aided design. [10]

Question 5

- 5.1. Outline the integrated drill and design flow and discuss the inputs in blast design. [20]
- 5.2. Discuss the importance of a geological database to a mine planning engineer. [5]

