



**FACULTY OF ENGINEERING AND THE ENVIRONMENT**

**DEPARTMENT OF MINING ENGINEERING**

**MINING METHODS**

**EMI 2205**

**Final Examination Paper**

**January 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**

<b>Question 1 to 5</b>	<b>25Marks</b>
<b>Part Questions</b>	<b>As shown in each part question</b>
<b>Total Attainable</b>	<b>100</b>

**Question 1 (25 marks)**

- a. Draw a neat sketch diagram of section through an open pit showing the following:
- bench, bench face, toe of bench, crest of bench, bench slope angle, pit floor, berm, berm height, berm slope angle, road and ramp width, overall pit slope angle **[12 marks]**
- b. As the project engineer for mining company X, you have been tasked to do a pre-feasibility study on a greenfield. Describe factors would you consider for the selection of a suitable mining method? **[8 marks]**
- c. The open pit has pit slopes which are benched. Explain why pit slopes are benched. **[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 development mining and production mining as applied to underground mining operations. **[12 marks]**
- b. Discuss the advantages and disadvantages of room and pillar mining method. **[8 marks]**
- c. What orebody geometric and rock features are necessary for the adoption of room and pillar mining method? **[5 marks]**

**Question 4 (25 marks)**

- a. In underground mining, there are four basic preliminary parameters considered in the adopting underground mining over surface mining. Describe these basic parameters. **[8 marks]**
- b. Explain Stope and Retreat vs. Stope and Fill as applied in underground gold mining. **[8 marks]**

c. Discuss the cycle of operations in mechanised overhand cut and fill stoping. **[9 marks]**

**Question 5 (25 marks)**

a.

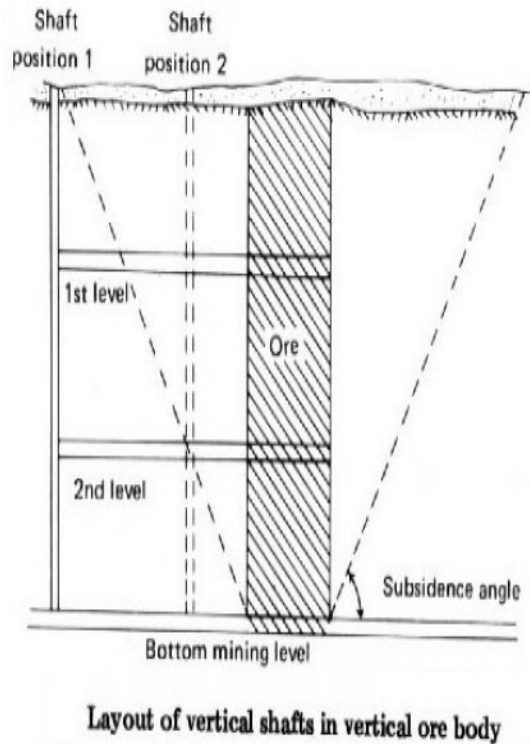


Figure 1: Shaft positions on a vertical vein

The positioning of a shaft is important in mine planning. Figure 1 shows vertical vein and two positions where a shaft can be positioned. Choose the position that is more favourable for positioning a shaft and explain your answer. **[6 marks]**

b. Discuss the shaft sinking cycle in underground mining operations. **[7 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]**