



**UNIVERSITY EXAMINATIONS**  
**FOURTH YEAR EXAMINATION FOR THE AWARD OF**  
**THE DEGREE OF BACHELOR OF SCIENCE IN GEOPHYSICS AND**  
**MINERALOGY**

**SECOND SEMESTER 2021/2022**  
**(FEBRUARY – JUNE, 2022)**

**BSMN 427: MINERAL ENGINEERING II**

**STREAM: Y4 S2**

**TIME: 2 HOURS**

**DAY: THURSDAY, 12:00 PM – 2:00 PM**

**DATE: 17/05/2022**

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**INSTRUCTIONS**

- 1. Do not write anything on this question paper.***
- 2. Answer Question ONE and any other TWO questions.***

**QUESTION ONE [30MARKS]**

- Define critical and strategic mineral (3 marks)
- State five challenges faced in producing critical and strategic minerals (5 marks)
- Explain the three differences between critical and strategic minerals (6 marks)
- Briefly explain five hazardous effect of mine gases (10 marks)
- State and explain three occupational safety measures in a modern mines (6 marks)

**QUESTION TWO [20 MARKS]**

- Define mine economics
- Explain the three main classification of mineral resources
- State three permissible electric equipments used in the mines

- (d) Explain how the equipments named in (c) above are used in the mine.

**QUESTION THREE [20 MARKS]**

- (a) State the principle of air flow in a mine (1 mark)
- (b) Explain the phenomenon of air cooling in the mine
- i. Natural ventilation (5 marks)
  - ii. Mechanics of air flow (5 marks)
  - iii. Distribution of air (5 marks)
- (c) State four respirable dust control parameter in a mine (4 marks)

**QUESTION FOUR [20 MARKS]**

- (a) Define geostatistics (1 mark)
- (b) State five areas where geostatistics is widely applicable (5 marks)
- (c) State two limitations of geostatistics (2 marks)
- (d) Discuss any four functional analysis of system (12 marks)

**QUESTION FIVE [20 MARKS]**

Describe five inventory models as used in engineering systems. (20 marks)