



UNIVERSITY EXAMINATIONS
SECOND YEAR EXAMINATION FOR THE AWARD OF
THE DEGREE OF BACHELOR OF SCIENCE GEOPHYSICS & MINERALOGY
SECOND SEMESTER 2022/2023
(JUNE - SEPTEMBER, 2022)

BSMN 225: MINERAL PROCESSING 1

STREAM: Y2 S2

TIME: 2 HOURS

DAY: MONDAY, 9:00 AM – 11:00 AM

DATE: 12/09/2022

INSTRUCTIONS

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

QUESTION 1

- a) Define the following terms as used in mineral processing (5 marks)
- pyrometallurgy
 - hydrometallurgy
 - Recovery
 - Ratio of concentration
 - Enrichment ratio
- b) Briefly discuss the economic justification of mineral processing in upgrading ores and minerals. (5 marks)
- c) Give five advantages of wet grinding in mineral processing (5 marks)
- d) State three reasons as to why gravity concentration method is preferred to flotation in mineral concentration. (3 marks)
- e) A tin concentrator treats a feed containing 1% tin and three possible combinations of concentrate grade and recovery are:

High grade 63% tin at 62% recovery

Medium grade 42% tin at 72% recovery

Low grade 21% tin at 78% recovery

Determine which of these combinations of grade and recovery produce the highest separation efficiency. Assume that tin is totally contained in the mineral cassiterite (SnO_2), which when pure contains 78.6% tin. (6 marks)

f) Discuss the three principles of classification as used in mineral processing (6 marks)

QUESTION 2

a) Discuss FIVE objectives of carrying out industrial screening in mineral processing (10 marks)

b) Discuss any five factors that affect the performance of cyclones (10 marks)

QUESTION 3

Describe the following methods in the process of minerals

- i. Heavy media separation(H.M.S) (5marks)
- ii. Humphreys spirals (5marks)
- iii. Free settling (5marks)
- iv. Hindered settling (5marks)

QUESTION 4

a) Give any five examples of industrial screens used in mineral processing (5 marks)

b) Discuss any five factors that affect the performance of industrial screens (15 marks)

QUESTION 5

a) Define a flow sheet (2 marks)

b) Give two types of flow sheets (2 marks)

c) Discuss the importance of the recovery-grade relationship (6 marks)

d) Discuss any five limitations of Separation Efficiency method (10 marks)