



**KISII UNIVERSITY**  
**UNIVERSITY EXAMINATIONS**

**SECOND YEAR EXAMINATION FOR THE AWARD OF  
THE DEGREE OF BACHELOR OF SCIENCE (GEOPHYSICS AND  
MINEROLOGY)**

**FIRST SEMESTER 2021/2022  
(FEBRUARY-JUNE, 2022)**

**BSMN 218: METALLIC AND INDUSTRIAL MINERAL DEPOSITS**

**STREAM: Y2 S1**

**TIME: 2 HOURS**

**DAY: THURSDAY, 9:00 AM – 11:00 AM**

**DATE: 12/05/2022**

---

**INSTRUCTIONS:**

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

**QUESTION ONE**

- a)** Define the following terms. (5marks)
- i.** Geophysical prospecting
  - ii.** Pegmatites
  - iii.** Batholiths
  - iv.** Basalts
  - v.** Detrital
- b)** Explain the three major rock types? ( 6 marks)

- c) Explain the role of pressure solution in the compaction and cementing of sediment. ( 3 marks)
- d) What two important layers in the Earth are responsible for plate tectonics? (2 marks)
- e) On what basis are minerals classified into different chemical groups, and of these, which forms the largest group? (5 marks)
- f) What is a mineral, and how does it differ from a rock? (3 marks)
- g) What is the difference between a rock's texture and structure? (3 marks)
- h) What sedimentary rock do we make the greatest use of in the modern world? (3 marks)

### **QUESTION TWO**

- a) What three iron minerals make up the bulk of iron ore? (3 marks)
- b) Give brief definitions of igneous, sedimentary, and metamorphic rocks, and describe how you might distinguish between them. (6 marks)
- c) Why are sand, gravel, and crushed stone such valuable natural resources? (4 marks)
- d) Which of the six minerals in the definition of asbestos is the most carcinogenic? (2 marks)
- e) What is meant by each of the following adjectives? (5 marks)
  - i) Mineral Deposits
  - ii) Acicular,
  - iii) Dendritic,
  - iv) Ore deposit,
  - v) Botryoidal,

### **QUESTION THREE**

- a) Earth materials below are hazardous to our health, discuss. (2 marks)
  - i) Asbestos
  - ii) Silicates
- b) What is meant by diagenesis? (1 mark)
- c) Metallic and nonmetallic minerals respond very differently to a hardness test. What are these differences? (2 marks)

- d)** What mineral groups tend to have high values of specific gravity? (3marks)
- e)** What are three common igneous pyroxenes? (2 marks)
- f)** Explain with a diagram the Bowens reaction theory. (8 marks)
- g)** How do the structures of pyroxenes and amphiboles differ From Bowens reaction Theory? (2 marks)

#### **QUESTION FOUR**

- a)** Describe the formation and occurrences of the following. (10 marks)
- i)** Magmatic Segregation,
  - ii)** Metamorphic Facies
  - iii)** Manganese deposits
  - iv)** Radioactive Minerals
  - v)** Hydrothermal solutions
- b)** Metamorphic rocks are classified using three different criteria, Discuss (3 marks)
- c)** What is the importance of the earth Material in the energy Industry (6 marks)
- d)** What are some of the commercial uses of these earth elements; (1 mark)
- i)** Granites?
  - ii)** Sodium Carbonate?

#### **QUESTION FIVE**

- a)** What is plate tectonics? (2marks)
- b)** Write an essay on the physical properties that characterize minerals and allow us to separate one from another. (10 marks)
- c)** Discuss with an aid of a diagrams three plate boundaries. (6 marks)
- d)** Outline categories of igneous rocks. (2 marks)