



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

*Faculty of Engineering and Technology*

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

**HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING**

AMA 3114: ENGINEERING GEOLOGY

**END OF SEMESTER EXAMINATION**

SERIES: AUGUST/SEPTEMBER 2011

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer booklet*

This paper consists of **FIVE** questions in **TWO** sections **A & B**

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

## SECTION A (COMPULSORY)

### Question 1

a) Explain the following terms used in sedimentary petrology

- (i) Diagenesis
  - (ii) Lithification
  - (iii) Cement
- (7 marks)

b) Differentiate the following terms

- (i) Xenoliths and Xenocrysts
  - (ii) Cleavage and Fracture
  - (iii) Streak and color
- (6 marks)

c) Define the following metamorphic textural terms

- (i) Phyllite
  - (ii) Hornfels
  - (iii) Mylonite
- (7 marks)

d) Describe the structure and texture of the following rock types:

- (i) Gneiss
  - (ii) Conglomerate
  - (iii) Granite
  - (iv) Basalt
- (10 marks)

## SECTION B (Answer *any TWO* questions from this section)

### Question 2

a) Differentiate the following:

- (i) Dike and Sill
  - (ii) Normal fault and Reverse fault
- (4 marks)

b) (i) Describe Luster  
(ii) List **SIX** descriptive terms used for describing non-metallic luster

(6 marks)

c) Outline the Silica tetrahedral classification of silicate groups

(12 marks)

### Question 3

a) Define the term hardness and explain how it can be determined

(4 marks)

- b) (i) List **THREE** agents of metamorphism  
(ii) Explain the processes that the agents in b(i) above cause rock transformation (6 marks)
- c) Briefly describe the **FOUR** types of metamorphism based on field classification (10 marks)

#### Question 4

- a) (i) Define the term tenacity  
(ii) Explain **SIX** terms used to describe tenacity in minerals (7 marks)
- b) Differentiate between the following terms  
(i) Mineral and Crystal  
(ii) Shale and Slate  
(iii) Heave and Throw (6 marks)
- c) (i) Explain **FOUR** factors that affect igneous rock textures  
(ii) Define the following igneous textural terms:  
(a) Glassy  
(b) Porphyritic (7 marks)

#### Question 5

- a) Describe the following textural terms  
(i) Granoblastic  
(ii) Porphyroblastic  
(iii) Poikiloblastic  
(iv) Idioblastic (8 marks)
- b) Describe **SIX** crystallographic forms observable in minerals (6 marks)
- c) Explain Moh's scale of Hardness (6 marks)