



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY  
DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**  
**BACHELOR OF SCIENCE IN CIVIL ENGINEERING**  
**(INSTITUTIONAL BASED EXAMINATION)**

**ECE 2302: ENGINEERING GEOLOGY**

**END OF SEMESTER EXAMINATION**

**SERIES: MARCH 2017**

**TIME: 2 HOURS**

**DATE: 30<sup>th</sup> MARCH**

## **Instructions to Candidates**

You should have the following for this examination

-Answer Booklet, examination pass and student ID

-Drawing instruments.

This paper consists of five questions.

Attempt any THREE questions.

**Do not write on the question paper.**

## **QUESTION ONE (COMPULSORY)**

(a) Explain the following terms used in sedimentary petrology:

i) Diagenesis

ii) Lithification

iii) Cement

(6 marks)

(b) Referring to the geological map (Figure 1, pg. 3):

i) Draw and label strike lines

ii) Draw Geological section x-y

iii) Find Dip and Strike of beds

iv) Write a brief geological history of the site

(16 marks)

(c) Discuss the geologic factors that affect selection of gravels and sands.

(8 marks)

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**Attempt any TWO questions**

**QUESTION TWO**

- (a) Briefly explain the silica content classification of igneous rocks. (10 marks)
- (b) Briefly outline the following as used in metamorphic rocks:
  - (i) Structural classification
  - (ii) Field classification

(10 marks)

**QUESTION THREE**

- (a) List **TEN** physical properties of minerals. (5 marks)
- (b) Explain the terms *linear*, *Areal* and *Volumetric* with respect to ground investigations. (6 marks)
- (c) Explain **THREE** advantages and **THREE** limitations of drilling as an investigation method. (9 marks)

**QUESTION FOUR**

- (a)
  - (i) Outline **FOUR** types of quarries
  - (ii) Explain **FIVE** prospecting methods used in quarrying (8 marks)
- (b) List **FOUR** important material properties considered in the selection of natural construction materials. (4 marks)
- (c) Briefly explain **FOUR** important factors in geological assessment of sands and gravels deposits. (8 marks)

**QUESTION FIVE**

- (a) Explain **TEN** geological characteristics that should be considered in tunneling (10 marks)
- (b) Differentiate between the following:-
  - (a) Gneiss and Schist
  - (b) Porphyritic and Porphyroblastic
  - (c) Tenacity and Hardness
  - (d) Cleavage and fracture
  - (e) Lopolith and Laccolith

(10 marks)

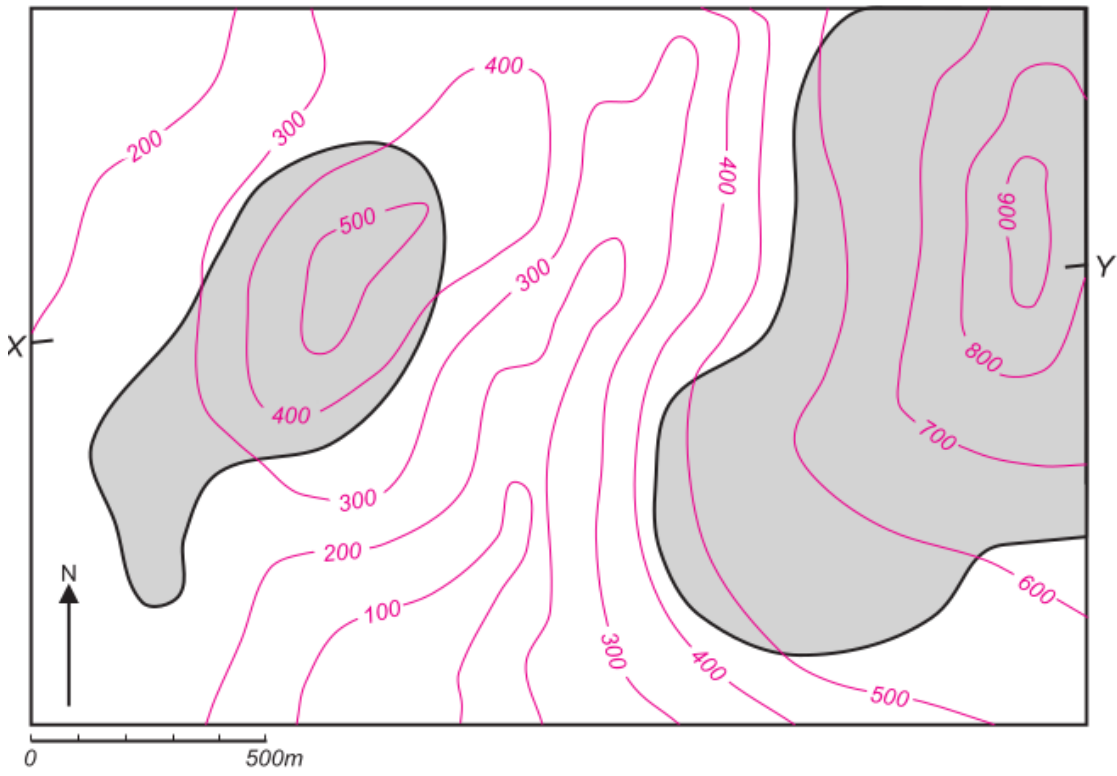


Figure 1: Geological Map

