



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

BSC IN CIVIL ENGINEERING

ECE 2302: ENGINEERING GEOLOGY

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

DATE: 11 May 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, Drawing Instruments, Scientific calculator, examination pass and student ID

This paper consists of five questions. Attempt question ONE (Compulsory) and any other TWO questions.

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

- Q1. (a) Briefly describe the following groundwater terms.
- ii) Aquifer, Aquiclude, Aquitard
 - iii) Permeability, Porosity, Hydraulic conductivity (8 marks)
- (b) Referring to the geological Map (Fig.1);
- (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) Describe the geologic factors that affect selection of gravels and sands

(6 marks)

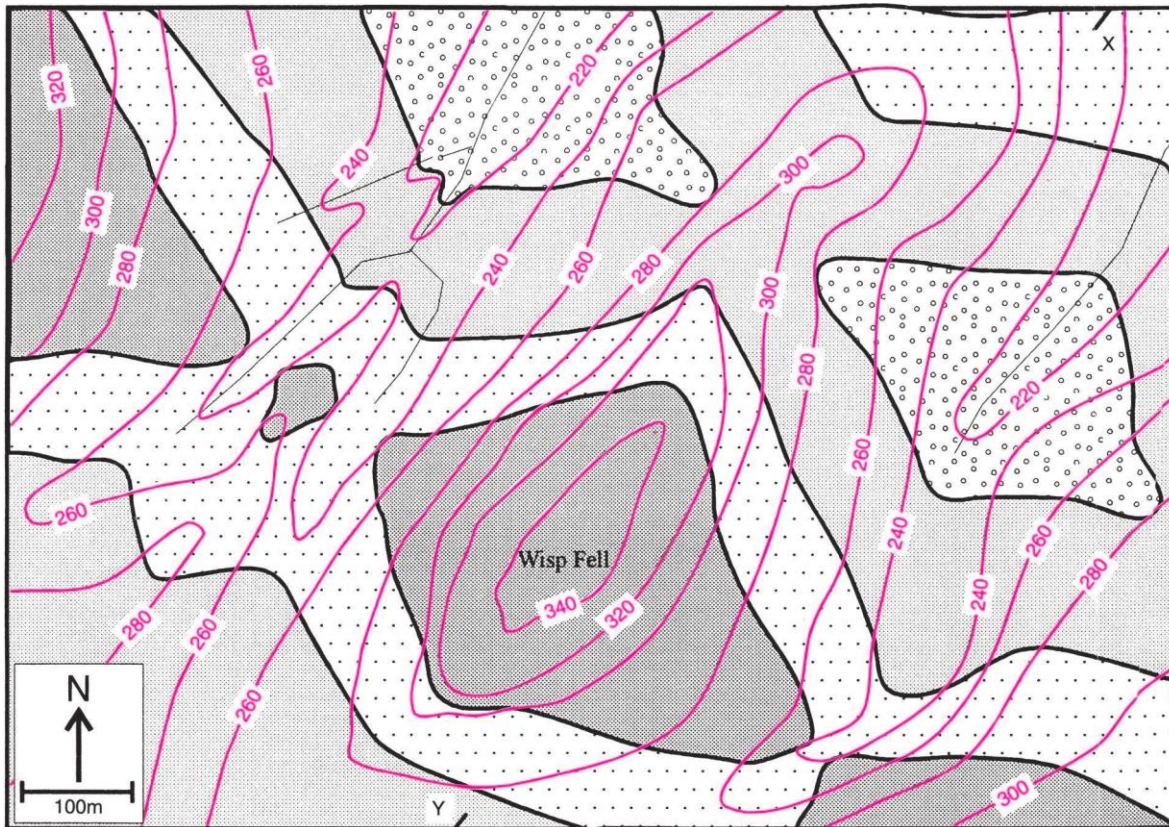


Figure 1: Geological Map

- Q2. (a) (i) List three agents of metamorphism
Explain the processes which the listed agents in a(i) cause metamorphism.
(6 marks)
- (b) (i) Explain five methods used in prospecting for quarries
i) Outline four limitations of blasting as a method of quarrying.
(14 marks)
- Q3. (a) Explain **eight** geological considerations made in tunneling (8 marks)
(b) Outline Geologic factors considered in the identification of Natural Building Stones (6 marks)
(c) Explain the relevance of the geologic time scale (6 marks)

- Q4. (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:-
 → Glassy
 → Porphyritic (7 marks)
- Q5. (a) Define the term hardness and explain how it can be determined (4 marks)
- (b) List three agents of metamorphism. Explain the processes by which they cause rock transformation. (6 marks)
- (c) Briefly describe the four types of metamorphism using field classification. (10 marks)