



DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY

UNIVERSITY EXAMINATIONS

2019/2020 ACADEMIC YEAR

**THIRD YEAR SPECIAL/SUPPLEMENTARY
EXAMINATIONS**

**FOR THE DEGREE OF BACHELOR OF SCIENCE
IN
CIVIL ENGINEERING**

ECE 2302 – ENGINEERING GEOLOGY

INSTRUCTIONS TO CANDIDATES

- This paper contains **FOUR** questions
- Answer question **ONE** and any other **TWO** questions
- No mobile phones allowed in the examination room

THIS PAPER CONSISTS OF (2) PRINTED PAGES

QUESTION ONE (30 MARKS) - COMPULSORY

- a) A philosophy of site investigation has built up over recent years which proposes the idea of the developing investigation advancing in stages to a satisfactory conclusion, each stage being built on a sound foundation of knowledge established by the previous stage. Describe five stages of site investigations under this philosophy. [10 Marks]
- b) Describe areas in which engineering geology is important in civil engineering. [6 Marks]
- c) Why might it be difficult to identify a mineral by its color? [4 Marks]
- d) Describe four uses of a geological map in a given location. [4 Marks]
- e) Explain at least four types of rock textures. [6 Marks]

QUESTION TWO (20 MARKS)

- a) List six guidelines for design of site investigations [6 marks]
- b) Give the divisions of geological time with respect to era and period. [6 Marks]
- c) Engineering geological maps are specifically designed for engineering purposes and give specific attention to certain features. List four such features. [4 Marks]
- d) Explain the economic importance of faulting patterns. [4 Marks]

QUESTION THREE (20 MARKS)

- a) Outline the following types of chemical weathering, showing the associated chemical reactions. [10 Marks]
- i). Oxidation
 - ii). Reduction
 - iii). Solution
 - iv). Carbonation
- b) Describe the process of making a small-scale engineering geological map. [10 Marks]

QUESTION FOUR (20 MARKS)

- a) Discuss at least four rock reinforcement methods undertaken when carrying out underground excavations or mining. [8 Marks]
- b) Describe three products of weathering. [6 Marks]
- c) Describe the THREE types of unconformities [6 Marks]