



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

THIRD YEAR SPECIAL/ SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECV 300 – ENGINEERING GEOLOGY

DATE: 26/3/2021

TIME: 8.30-10.30 AM

INSTRUCTIONS

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

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)