The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Civil Engineering

Study Programme	: Bachelor of Technology Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	**: CVX4344/CVX5532 Engineering Geology**
Academic Year	: 2021/2022
Date	: 22nd February 2023
Time	: 0930-12.30 hrs
Duration	: **3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **Eight (8)** questions in **Three (3)** pages.
3. Answer any **Five (5)** questions only. All questions carry equal marks.
4. Answer for each question should commence from a new page.
5. Relevant charts/ codes are provided.
6. This is a Closed Book Test (CBT).
7. Answers should be in clear hand written.
8. Do not use Red colour pen.

Q1. Historically, Geo-scientists have made enormous effort to understand the structure of the Earth.

(a).Discuss in detail how the geo-scientists have established the interior structure of the Earth. (10 Marks)

(b).Briefly describe the distribution and composition of the earth crust. (5 marks)

(c). Write a short account on the distribution of different rock/element types in the Earth's interior structure. (5 marks)

Q2. Since the minerals are the building blocks of rocks, the physical and mechanical characteristics of minerals play an important role in the strength of rocks.

(a). Discuss the above statement. (10 marks)

(b). Name Five (05) main types of Silicate Minerals present in rocks. (5 marks)

(c). Write a short account on Clay Minerals in rocks. (5 marks)

Q3. Write short notes on the following:

(a). Formation, properties and composition of Gabbro Rock (4 marks)

(b). Oceanic-Continental Convergence (4 marks)

(c). Weathering resistance of Minerals (4 marks)

(d). Valley Deepening in formation of River valleys (4 marks)

(e). Effluent and Influent Streams (4 marks)

Q4. Historically, oscillatory movements of the Earth's Crust have caused substantial destruction to human civilisations.

(a).Explain the reasons of these oscillatory movements of the Earth's Crust. (10 marks)

(b).Based on the answer to the Q4(a), briefly discuss the most vulnerable areas for these ground oscillatory movements in the world. (06 marks)

(c).Name four (04) types of Mountains based on their origin. (04 marks)

Q5. A sound understanding on the structural geological features is essential in the evaluation of the Engineering behaviour of the subsurface.

(a) Define "Apparent Dip" of a Joint Plane with thé use of a neat sketch. (5 marks)

(b) Briefly describe the different types of Folds with the use of neat sketches. (5 marks)

(c) Define different parts of a Fault using a neat labelled sketch. (5 marks)

(d) Differentiate between a Normal Fault and a Reverse Fault. (5 marks)

Q6. Weathering alters the Engineering Properties of Rocks.

(a). Explain in detail how weathering alters the engineering properties of rocks. (8 marks)

(b). Explain how "Organic Life" contributes to the Chemical Weathering of rocks. (7 marks)

(c). List five (05) factors that contribute to soil formation process. (5 marks)

Q7. Although Groundwater as a source in the distribution of water in the Earth Crust is very small compared to the other sources, it provides a substantial contribution as a source of Drinking water.

(a). List and explain different types of geological occurrences of Groundwater. (10 marks)

(b). Briefly describe the characteristics of an Aquifer. (5 marks)

(c). Briefly discuss the aquifer potential of an igneous rock mass. (5 marks)

Q8. Safe and Economical Design of foundations is imperative as a professional Engineer.

(a). Briefly describe the impacts of effective planning of a geotechnical investigation programme on the design of safe and economical foundations. (10 marks)

(b). List five (05) governing factors in the selection of the Boring method in a geotechnical investigation programme. (5 marks)

(c). Write a short account on the estimation of the in-situ permeability of a rock mass. (5 marks)