



Study Programme	: Bachelor of Science Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	: CVX4344/CVX5532 Engineering Geology
Academic Year	: 2022/2023
Date	: 21 st February 2024
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 **Two (2)** 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.
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Q1. Geotechnical Engineering a subdiscipline of Civil Engineering, relies significantly on the principles of Geotechnical Engineering.

(a). Define the term “Engineering Geology”. (05 Marks)

(b). Briefly describe the relationship between “Engineering Geology” and “Geotechnical Engineering”. (10 marks)

(c). Write a short account on “Geologic Column” that is related to Geological Time Scale. (05 marks)

Q2. Seismic waves are used to determine the structure of the Earth Interior.

(a). What are Seismic Waves? (05 marks)

(b). List and describe different types of Seismic Waves. (10 marks)

(c). Describe briefly how Seismic Probing can be used to determine the structure of the Earth Interior. (05 marks)

Q3. Write short notes on the following:

(a). “Streak” of a mineral (4 marks)

(b). “Dome” type geological structure (4 marks)

(c). Standard Penetration Test (4 marks)

(d). In-situ Soil Permeability Test (4 marks)

(e). Stationary Piston Sampler (4 marks)

Q4. Erosion is the geological process in which earth materials are worn away and transported by natural forces such as wind and water.

(a). Explain the different types of mass movements that occur within the earth crust. (06 marks)

(b). Briefly describe the various processes involved in erosion of riverbeds. (06 marks)

(c). List different types of geological features found within a typical flood plain accompanied by a neatly drawn illustration. (08 marks)

Q5. A solid foundation in engineering geology is essential for the effective exploration of groundwater resources.

- (a) List five (05) geological boundaries along with a neatly drawn illustration. (05 marks)
- (b) Define the term “Transmissibility”. (05 marks)
- (c) Describe the function of groundwater as an erosional and transportation agent supported by geological evidences. (10 marks)

Q6. Effective planning in the early phases of a geotechnical investigation programme is essential for obtaining adequate and high-quality data at minimal cost.

- (a). List the main objectives of an engineering geological investigation. (08 marks)
- (b). Explain in detail the different stages of a geotechnical investigation programme. (12 marks)

Q7. In a geotechnical engineering investigation programme, subsurface exploration is conducted to acquire the necessary engineering parameters for foundation design.

- (a). Briefly describe about the hand auger boring technique with different types of augers used and their applications (08 marks)
- (b). Give a brief explanation of a subsurface exploration method categorized under “Continuous Sample Methods of Advance”. (06 marks)
- (c). Explain the process of obtaining an undisturbed sample from a test pit with the help of a neatly drawn diagram. (06 marks)

Q8. Utilizing of appropriate sampling techniques and sampling tools is essential to acquire soil / rock samples of the necessary quality.

- (a). List five (05) factors that differentiate a disturbed soil sample from an undisturbed sample. (05 marks)
- (b). Define the term “Degree of disturbance” in soil samples and outline the various parameters used to gauge this attribute of “Degree of disturbance”. (05 marks)
- (c). Briefly describe about Piston Samplers used in soil sampling along with their specific applications. (10 marks)