

**UNIVERSITY OF COLOMBO, SRI LANKA**  
**FACULTY OF ARTS**  
**SPECIAL DEGREE EXAMINATION IN ARTS (GEOGRAPHY) – PART III**  
**FIRST SEMESTER FINAL EXAMINATION – 2021/2022**  
**GYG 4191 - Applied Soil Science**  
**Time: Two (2) hours**

**Answer only 03 questions including Question 01.**

Calculators can be used.

A semi log paper is supplied.

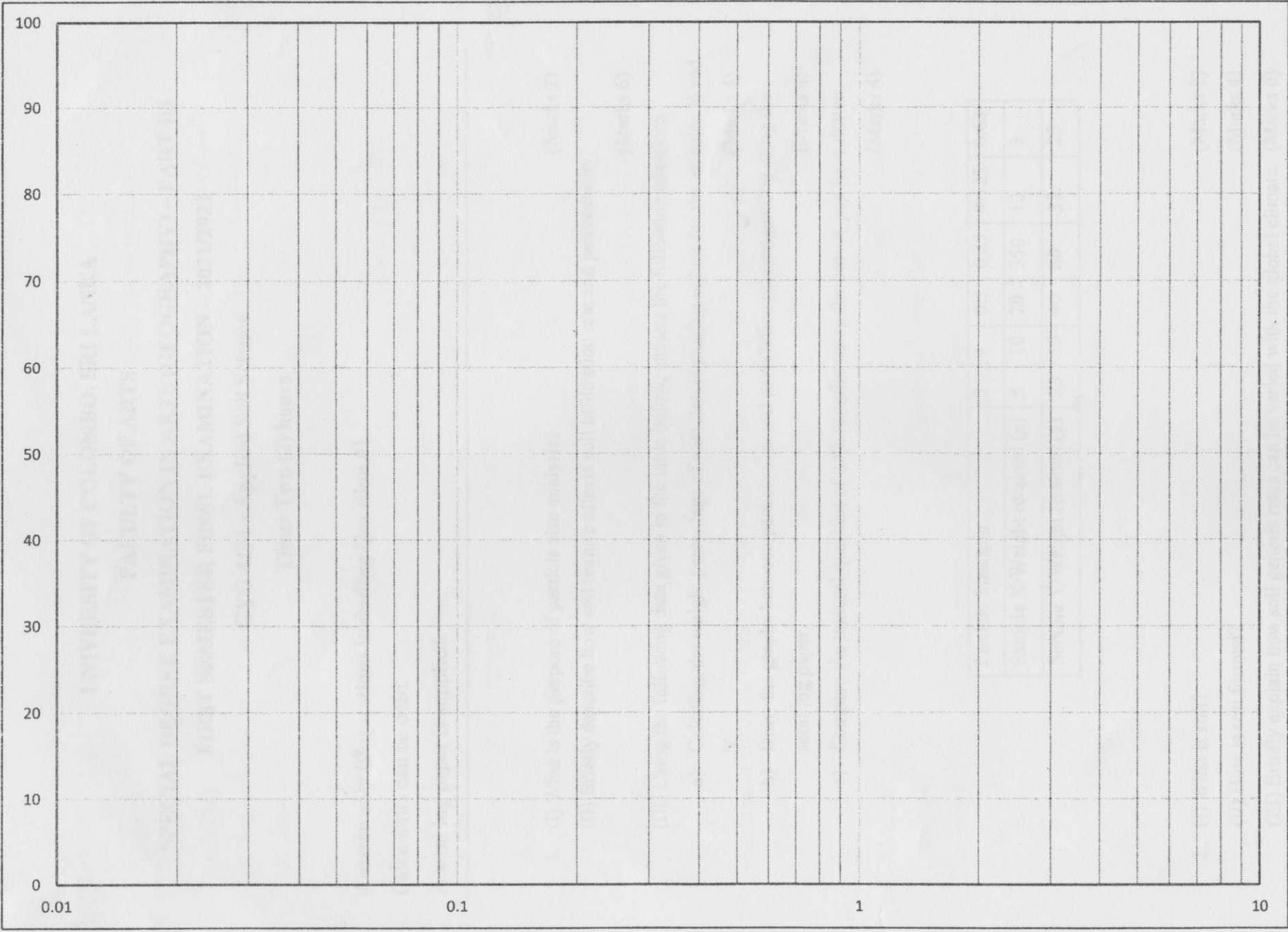
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1. (I) What is the purpose of particle size analysis? (Marks 2)  
(II) Briefly describe how soil texture affects soil infiltration rate and permeability. (Marks 6)  
(III) Using the following data given in the table below, answer the following questions
- a) Calculate the weight percentage of cumulative passing values for the samples X and Y. (Marks 4)
  - b) Draw the graphs between particle size and cumulative percent passing using the semi log paper. (Marks 4)
  - c) Compare the textural qualities of both samples using the curves you have drawn. (Marks 4)

Particle Size/mm	2	1	0.5	0.25	0.125	0.063
Sample X/Weight retained (g)	5	10	20	350	12	3
Sample Y/Weight retained (g)	25	30	40	60	35	25

2. (I) What is soil? (Marks 2)  
(II) How is soil formed? (Marks 4)  
(III) Briefly explain how soil genesis rates can be varied with the global climate. (Marks 6)  
(IV) Explain how soil becomes a valuable resource in the future world. (Marks 8)

3. (I) What are the factors of soil formation? (Marks 2)  
(II) Draw a labelled diagram of a soil horizon. (Marks 4)  
(III) Briefly describe how soil acts as a facilitator of other spheres. (Marks 6)  
(IV) Explain how the depth of a soil horizon is governed by the local climate, referring to Sri Lanka. (Marks 8)
4. (I) What is a live soil? (Marks 2)  
(II) List the types of soil microorganisms. (Marks 4)  
(III) Briefly describe how microorganisms enhance soil. (Marks 6)  
(IV) Explain how the soil microorganisms are affected by modern agricultural activities. (Marks 8)
5. (I) What forms of carbon are present in soil? (Marks 2)  
(II) How is the soil carbon pool enriched? (Marks 4)  
(III) Briefly explain how soil carbon stock is affected by global climate. (Marks 6)  
(IV) Storing carbon in soil can be a solution to mitigate the impact of present climate change. Defend your argument. (Marks 8)
6. (I) What is residual soil? (Marks 2)  
(II) List the different types of sediments. (Marks 4)  
(III) Briefly discuss the sediment dynamics of a fluvial environment. (Marks 6)  
(IV) Explain how fluvial sediment deposition is affected by sea level fluctuation. (Marks 8)
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(13) Analyze explain how soil particles may be related with its global climate. (10 marks)

(14) Explain how well becomes a variable measure in the future world. (10 marks)