EASTERN UNIVERSITY, SRILANKA

SECOND YEAR FIRST SEMESTER EXAMINATION AGRICULTURE – 2000/2001

ACH 2101 : SOIL PHYSICAL PROPERTIES

Time: 3 hours
Answer All Questions
This paper should be answered in English

1.a) Sedimentation is the process used in separating the finer particles of soil during textural analysis. Write the law and the working equation used for sedimentation analysis and show its applicability to soil systems.

b) Clay particles having the diameter of 0.02mm takes 6 hours to fall 10cm in a soil solution. How much time will a silt particle having the diameter of 0.002mm take to fall 10cm depth in the same solution under a similar temperature.

2. a) Discuss the bulk density and true density of a soil.

b) A sample of moist soil having a wet mass of 950g and a volume of 600 cm^3. It was dried in the oven and found to have a dry mass of 750 g. Assume the particle density for mineral soil is 2.65g/cm^3. Calculate the following.

   i. Bulk density   ii. Void ratio

   iii. Gravimetric water content   iv. Saturation ratio

    v. Air filled porosity.

3. a) What do you understand by the term porosity and briefly explain the factors affecting it.

b) "Compared to percentage of total pores individual pores are important"- Comment on this statement.

$\frac{V_u}{V_t}$

$100 - \left(\frac{d_b}{d_p} \times 100 \right)$

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4. a) Explain the following terms used to describe structure of a soil profile distribution;

    i. Strong fine sub angular blocky

    ii. Moderate medium columnar

    iii. Weak large crumb

  b) Briefly explain aggregate formation and its stability.

5. Write Short notes on the following;

  a) Soil colour and factors affecting soil colour

  b) Effect of soil texture on the physical behavior of soil.

  c) Structural management of course textured soils and rice soils.

6. a) Explain about soil aeration and its effect on plant growth.

  b) Briefly discuss the factors affecting soil temperature and its control.

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