RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B. Sc. (General) Degree
Third Year - Semester II Examination – September / October 2013

PHY 3206 – SOIL PHYSICS

Answer all questions   **Time: 2 hours**

The use of a non - programmable calculator is permitted.

1. (a) What is "saturated water flow" in soil?

   (b) Define the Darcy's law for saturated water flow, identifying the quantities involved.

   (c) Discuss the Falling Head Method, used to determine the Saturated Hydraulic Conductivity of relatively impermeable soils.

2. (a) Briefly discuss the physical and chemical weathering processes.

   (b) List the "soil forming factors".

   (c) Compaction of a certain dry soil by tillage changed the bulk density from 1.20 to 1.70 g cm^{-3}. If the soil's particle density is 2.65 g cm^{-3}, calculate the following.

   (i) The initial porosity of the soil.
   (ii) The compacted porosity of the soil.
   (iii) The percentage porosity of the soil, lost due to compaction.

3. (a) Write a detailed account on "soil water" paying special attention on field capacity and permanent wilting point.

   (b) *"The field capacity is high in heavy soils which are rich in clay particles"*
   Explain the above statement.

4. Write <u>short notes</u> on the following.

    (i)   1:1 clays.

    (ii)   Soil structures.

    (iii)   Void ratio of a soil.

    (iv)   Tillage mechanics.

- End -