The Open University of Sri Lanka

Faculty of Engineering Technology

Final Examination- 2005

AEX5232 Soil plant water relationship

Date : 01-04-2006

Time : 0930-1230 hrs

Section 2

1. (a) Define field capacity (FC), permanent wilting point (PWP) and available water holding capacity (AWC) in relation to a soil -plant-water system.
   (b) Draw a typical soil moisture release curve for sandy, loamy and clayey soil and explain the reasons for the differences in these three curves.
   (c) A soil with a FC of 22% and a PWP of 12% (by volume respectively) is used to grow a crop with a root depth of 0.8m. Determine the AWC.

2. (a) Briefly explain the terms gravitational potential, matric potential, pressure potential and total potential.

   (b) Two points in a soil A and B have matric potentials of -100cm and -90cm respectively. A is directly above B by 5 cm. Calculate the soil water potentials at points A and B and determine the direction of water movement.

3. (a) Describe the terms infiltration and percolation
   (b) Briefly explain the factors affecting the rate of infiltration
   (c) Describe one method to measure infiltration in the field

4. (a) Describe the different mechanisms and driving forces involved in the absorption of solutes by plants and factors affecting absorption of water in plants

   (b) Discuss the reasons for water deficit in plants and how plants react to water deficit

5. (a) Briefly describe the importance of soil aeration and the mechanisms which govern the movement of air into and from the soil
   (b) Describe the heat exchange between soil and air.

6. Write short notes on any three of the following.
   (i) Thermal characteristics of soil
   (ii) Hysteresis
   (iii) Lysimeters
   (iv) Eutrophication
   (v) soil erosion