



The Open University of Sri Lanka
 Faculty of Engineering Technology
 Industrial Studies (Agriculture) & Technology (Agricultural Engineering)
 Program of Study
 Final Examination – 2014/2015
 AEX4232 Soil & Water Conservation

Date : 08/09/2015
 Time : 09.30 a.m. – 12.30 p.m.
 Duration : Three (03) hours

Registration number:

Section 02 – Answer any four (04) out of the six (06) questions. You may use answer books and/or sheets to answer this section.

- 1) a) What is runoff? Discuss the different categories of runoff.
 b) What is run-off coefficient? Explain how run-off coefficient varies with different soil types, slopes and land use patterns.
 c) An agricultural field with an area of 2.5 ha receives rainfall with an intensity of 90 mm/hour. If the run-off coefficient is 0.4, calculate the peak runoff rate.
- 2) a) State Kennedy's Theory in channel systems.
 b) A trapezoidal irrigation channel has a bottom width of 1.8 m, side slopes 1:1, a bed gradient of 0.003, and full supply depth of 0.6 m. Consider Manning's coefficient of roughness as 0.025.
 (i) Calculate the mean velocity of the water flow.
 (ii) Calculate the discharge of the channel.
- 3) a) What is soil erodibility?
 b) Discuss the soil characteristics that influence soil erodibility.
 c) A tea grower cultivates tea in a sloping land where the rainfall erosivity index is 654 and the soil erodibility factor is 0.17. The slope length and the steepness of the land are 400 m and 3%, respectively. If soil conservation practices are not carried out in this land, calculate the annual soil loss per area. (Note that the cropping factor for tea is 0.57.)
- 4) a) Explain the different mechanisms of sediment transportation.
 b) The total eroded soil weight at a catchment is 381,807 tons. If the actual sediment yield at a specific point in the watershed is 68,808.1 tons, calculate the sediment delivery ratio.
 c) State what you can conclude based on the answer for question 4) b).

- 5) a) Describe how different soil conservation methods have evolved with time.
b) Discuss the political, soil, and economic features that cause soil conservation problematic.

- 6) a) State the principle behind practicing conservation farming in a degraded soil.
b) Discuss the benefits of conservation farming for farmers and the agricultural environment.