EASTERN UNIVERSITY, SRI LANKA

FIRST YEAR SECOND SEMESTER EXAMINATION IN AGRICULTURE- 2010/2011

AE 1201 ENGINEERING HYDROLOGY AND HYDRAULICS

Time allowed : Two hours
Answer **all** questions

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01. (a) Briefly describe the factors affecting runoff.

(b) A circular plate 4 m in diameter is vertically immersed in water so that its upper edge is 2 m below the water. The plate is having a triangular hole which has a base of 1 m and height of 0.75 m. In such position, its vertex coincides with the centre of the plate and the base is above the centre of the plate parallel to the water surface. Assume specific weight (ω) of the water is 1000 kg/m^3.

(i) Calculate the total pressure.

(ii) Find the centre of pressure.

02. (a) List the factors affecting infiltration capacity of soil.

(b) Briefly describe how soil moisture affects infiltration capacity of a given soil.

(b) Find the most economical cross section of a rectangular channel to carry 0.3 m^3/s of water, when bed slope is 1 in 1000. Assume Chezy's C = 60.

03. (a) Briefly discuss the measurement of infiltration by using infiltrometer.

(b) The quantity of water flowing through a 2.5 m long vertical pipeline which tappers from 15 cm at top to 7.5 cm at bottom with a discharge of 25 *l* /s. Calculate the pressure difference between top and bottom of the pipe.

Please Turn Over

04. (a) Discuss the assumptions made in the use of Unit Hydrograph.

(b) A pipe ABC connecting two reservoirs is of 75 mm diameter. From A to B it is horizontal and from B to C it falls 3.3 m. The length of AB and BC are 24 m and 15 m respectively. The water level in the reservoir at A is 3.7 m above the pipe and the level in the second reservoir is 1 m above the pipe at C.

Assume f is 0.006 and take the entrance energy degradation as being equal to $0.5\frac{v^2}{2g}$ and the water barometer is 10.35 m.

(i) Find the discharge rate in m^3/s.

(ii) What is the absolute pressure head in the pipe at B?

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