

EASTERN UNIVERSITY, SRI LANKA

THIRD YEAR FIRST SEMESTER EXAMINATION IN AGRICULTURE-2009/2010

(May/June 2011)

AEN 3101 HYDRAULICS AND HYDROLOGY (2:30/00)

Time: 2 hours

Answer all questions



- 1) (a) Define the term interception?
(b) Briefly describe the measurement of interception?
(c) Describe the precipitation methods based on the adiabatic cooling process

- 2) (a) Distinguish between Lamina flow and turbulent flow
(b) Two reservoirs which are at a distance of 1000m apart are connected by a sharp edged pipe line. The first half of the pipe is 10cm diameter and the second half is 20 cm diameter and the change of section is sudden. The difference in water levels in two reservoirs is found to be 30m. Consider the all losses that occur in the pipe. (frictional co-efficient of pipe is 0.01)
 - i. List out the losses that happen during this flow through the pipe.
 - ii. Find out the velocities in two pipes.
 - iii. Determine the total loss and flow rate through the pipe.

- 3) (a) Derive the Bernoulli's equation for the flow of incompressible, frictionless fluid
(b) A pipe line gradually varies from 15cm in diameter at A to 7.5cm at B. the point A is 6m above the datum While the point B is 3m above the datum. The velocity at A is 3.6ms^{-1} . Determine the pressure at B, if the pressure at A is 10000kgm^{-2} .
(Specific weight of water is 1000kgm^{-3})

- 4) (a) What is the difference between liquid flow through close and open pipes?
- (b) A rectangular channel having the most efficient section (economical) carries water per second. If the velocity of the water is 2m/sec, determine the following most economical rectangular section. (Given Chezy's constant $C = 60$)
- (i) The area of flow.
 - (ii) The depth of channel
 - (iii) The breadth (width) of channel
 - (iv) The hydraulic mean depth
 - (v) The slope of the bed.
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