

THE OPEN UNIVERSITY OF SRI LANKA
 Faculty of Engineering Technology
 Department of Agricultural & Plantation Engineering



Bachelor of Industrial Studies Honors (Agriculture)

Final Examination (2016/2017)
 AEX6235: Hydrology and Water Resources

Date: 23rd November 2017 (Thursday)

Time: 9:30 am – 12:30 pm

Index Number:

Instructions

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

- Q1.** (a) Briefly explain the siting of a rain gauge.
- (b) (i) Explain briefly how to estimate the missing precipitation data.
- (ii) One of four monthly read rain gauges on a catchment area develops a fault in a month when the other three gauges record respectively 37, 43 and 51 mm. If the average annual precipitation amounts of these three gauges are 726, 752 and 840 mm respectively and of the broken gauge 694mm, estimate the missing monthly precipitation at the latter.
- Q2.** a) Briefly explain the salt water intrusion in the coastal areas and its prevention measures.
- b) Prove that every meter that water table is above sea level, fresh water will extend below sea level for 40m before salt water occurs.
- Q3.** (a) Derive the equation to calculate the discharge (Q) for a well in an unconfined aquifer in equilibrium condition using a suitable diagram.
- (b) A well with a diameter of 200 mm in a confined aquifer with a thickness of 10 m is pumped at a steady rate of 30 l/minute. The drawdown at the pumping well is 2 m below ground level and the drawdown at an observation well 500 m away is 0.5 m. Assuming the ground to be flat and assuming equilibrium conditions determine the transmissivity of the aquifer.

- Q4.** (a) Write a brief note on the role of runoff on soil water storage and natural recharge using suitable diagrams
(b) Briefly describe how you can minimize runoff after intensive rainfall using your knowledge on factors affecting runoff.
- Q5.** (a) Briefly explain why we need to study the Hydrological cycle using water resources project in Sri Lanka
(b) Briefly discuss the strengths and weaknesses of Uma Oya project in Sri Lanka.
- Q6** Write short notes on any three (03) of the following
- (i) Role of solid waste on groundwater contamination
 - (ii) Factors affecting runoff
 - (iii) Hydrological Cycle
 - (iv) Pumping Test

END OF PAPER