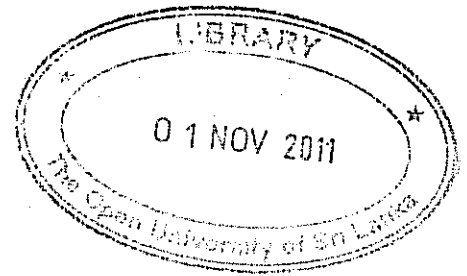




The Open University of Sri Lanka  
 Faculty of Engineering Technology  
 Industrial Studies (Agriculture) Program

Final Examination- 2010/2011

**AEI6235 Hydrology and Water Resources**



Date : 10-03-2011  
 Time : 0930-1230 hours  
 Duration : Three (03) hours

**SECTION 2: Answer any four (04) questions. All questions carry equal marks.**

1. (a) Briefly explain the siting of a rain gauge.  
 (b) Explain briefly how to estimate the missing precipitation data.  
 (c) 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.
2. (a) Briefly explain the zone of aeration and saturation with a suitable sketch.  
 (b) What is groundwater recharge and explain its importance on sustainable groundwater resources management.
3. (a) Briefly explain quality standards for irrigation water.  
 (b) Write a brief account on the salt water intrusion as one way of groundwater contamination.
4. (a) Write a brief note on Driven and jetted tube wells.  
 (b) Briefly describe the factors that you consider while designing the tube well
5. (a) Write a brief note on runoff cycle.  
 (b) A particular catchment experienced a uniform intensity storm in which, 30 mm of rain fell. The peak gauged runoff from the catchment was 14.0 m<sup>3</sup>/s, and it was estimated that 3.0 m<sup>3</sup>/s of this consisted of baseflow. Assuming similar antecedent conditions, and the same rainfall duration, what would be the peak gauged runoff from a storm of 15 mm?  
 (c) Briefly explain the factors affecting the runoff.
6. (a) Differentiate between an unconfined aquifer and a confined aquifer?

- (b) A well is pumped at a rate of  $2000\text{m}^3/\text{day}$  for 3 hrs. The drawdown in an observation well 120m away is measured with time and is given below. Calculate the transmissivity and storage coefficient of the aquifer.

Time since pump started (minutes)	Drawdown (m)	Time since pump started (minutes)	Drawdown (m)
1	0.05	18	0.55
1.5	0.08	24	0.61
2	0.11	30	0.65
2.5	0.15	40	0.69
3	0.16	50	0.73
4	0.20	60	0.76
5	0.24	80	0.79
6	0.28	100	0.83
8	0.35	120	0.87
10	0.40	150	0.91
12	0.43	180	0.95
14	0.46		