



The Open University of Sri Lanka  
 Faculty of Engineering Technology  
 Industrial Studies (Agriculture) Program  
 Final Examination- 2013/2014  
 AEI6235 Hydrology and water resources

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

1. (a) Briefly discuss the measures of average in the statistical concepts of Hydrology.  
 (b) Describe of determination of aerial rainfall.
2. (a) Write a brief note on Unit Hydrograph.  
 (b) Briefly discuss the factors affecting the shape of the hydrograph.
3. (a) Briefly explain and compare the aquifer yields in unconsolidated materials, sedimentary rocks and crystalline rocks.  
 (b) A cofferdam is built for the construction of a dam. The construction period is 2 years. A plot of annual peak flows against probability for the river flows showed that  $10000 \text{ m}^3/\text{s}$  would be exceeded 10% of the time. What is the chance that  $10000 \text{ m}^3/\text{s}$  would be exceeded in the 2 years?
4. (a) Write a brief note on types of wells tube wells.  
 (b) A well in a confined aquifer of thickness of  $D$  is pumped at a rate of  $Q$ . Diameter of the well is  $r_0$ , water level in the well is  $h_0$  and the height of rest water level is  $H$  above datum. Neglect well losses. Take hydraulic conductivity as  $k$ . Derive an expression for the height of water table at a distance from the center of the well. Assume steady state conditions.
5. (a) Briefly explain three (03) methods for stream gauging including current meter.  
 (b) Compute the discharge of the stream using the current meter data given below

Distance (m)	0	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6
Depth (d)	0	0.3	1.29	2.16	2.55	2.22	1.68	1.41	1.05	0.63	0.42	0
Velocity (m/sec) at 0.2d	0	0.42	0.57	0.78	0.87	0.81	0.75	0.69	0.63	0.54	0.45	0
Velocity (m/sec) at 0.8d	0	0.21	0.36	0.54	0.60	0.30	0.51	0.45	0.39	0.33	0.30	0

6. Write brief note on any three (03) of the following
- (a) Siting of rain gauge
  - (b) Infiltration indices
  - (c) Aquifer particle size analysis
  - (d) Pumping test of wells