The Open University of Sri Lanka

Faculty of Engineering Technology

Bachelor of Industrial Studies (Agriculture)

Final Examination- 2011/2012

AEI6235 Hydrology and water resources

Date   : 01-03-2012
Time   : 0930-1230 hours

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

1. (a) Briefly explain the types of correlation used and its importance in Hydrological studies.
   (b) Following is the frequency table of the river flow in m³/s. Calculate the standard deviation.

X mid point	Frequency
6.95	3
10.95	5
14.95	7
18.95	6
22.95	3
26.95	1

2. (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.

3. (a) Briefly explain the types of current meters used in stream gauging with suitable diagrams and the advantages of using current meters.

(b) Compute the discharge of the stream whose current meter readings are as follows:

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) in m	0	0.3	1.2	2.1	2.5	2.2	1.6	1.4	1.0	0.6	0.4	0
Velocity (m/sec) at 0.2d	0	0.4	0.5	0.7	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0
Velocity (m/sec) At 0.8d	0	0.2	0.3	0.5	0.6	0.3	0.5	0.4	0.3	0.3	0.3	0

4. (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.

5. Briefly describe a geophysical method in groundwater exploration and estimation of aquifer yields with special reference to Sri Lankan conditions.

6. 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) Construction of tube wells