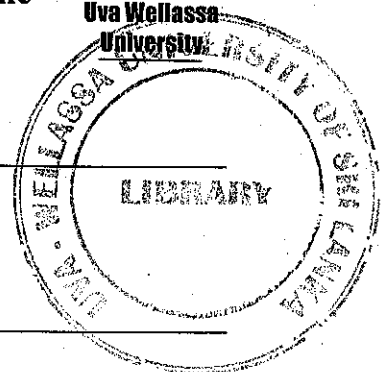


Uva Wellassa University, Sri Lanka
Faculty of Science and Technology
Mineral Resources and Technology Degree Programme
1st Semester Examination – March/April 2013



MRT 323-1 Pollutant Transport in Water

Number of questions: Four (04)

Answer **all** questions

Time allocation : One (01) hour

Total marks : 100

1.
 - a. Group different types of water contamination sources into major categories. Indicate the type of contaminants derived from each source. (10 marks)
 - b. Distinguish between point- and diffuse sources of groundwater contamination. Graphically display the contaminant loading history of continuous source loading with variable concentration. Give examples for this type of contaminant loading. (15 marks)
2.
 - a. Compare and contrast molecular diffusion and dispersion. (05 marks)
 - b. Illustrate Fick's first law applied to diffusion in 1-D. Then extend it to 3-D. (10 marks)
 - c. Define *flux density* of a contaminant transported in a surface water body under advective transport. What should you consider additionally to calculate the flux density of the same contaminant, when it is transported in groundwater environment? (10 marks)
3.
 - a. Explaining the main differences between lakes and estuaries, describe mixing processes taking place in these two surface water bodies. (10 marks)
 - b. Sketch the longitudinal and transverse velocity profiles of a river. Explain how velocity shear generates in river flow. How does it lead to mixing? (15 marks)
4.
 - a. How do particles in water bodies affect contaminant transport? Give an expression for particle setting velocity and define all terms. (10 marks)
 - b. Chemical and biological conditions prevailed in and around a water body are reflected in its sedimentary profile. Explain. (15 marks)