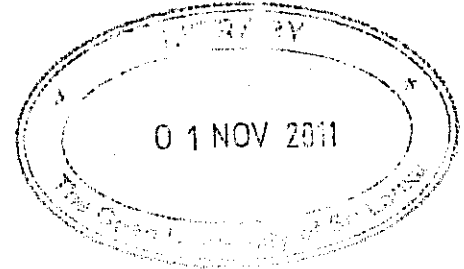




The Open University of Sri Lanka  
Faculty of Engineering Technology  
Industrial Studies Program

Final Examination- 2010/2011

**AEX6233 Hydrology**



Date : 01-04-2011  
Time : 1400 - 1700 hours  
Durations : Three (03) hours

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

1. Briefly explain application of Darcy's law use in ground water engineering.
2. What is "Dupuit" equation? State the assumptions that enter in its development. Explain the "Theis" formula and define well function?
3. A production well tapping an unconfined aquifer an initial saturated thickness of 8.2 m. A fully penetrating 25 cm diameter this well is pumped at rate of 65 liters per second until a steady state cone of depression is established. The draw down (from ground surface) measured at two observation wells situated 15 m and 31 m from the pumped well are then found to be 5.30 m and 4.90, respectively. Initial water level below the ground surface (level) is 3.50 m.
  - a. Determine the hydraulic conductivity and transmissivity of the aquifer
  - b. If all the observation points were on the Dupit curve, what was the stabilize water level from ground level in the production well.
- 4 Explain ground water availability in Sri Lanka and threats to groundwater quality in Sri Lanka with suitable diagram.
- 5 Differentiate between shallow dug wells and deep tube wells. How are dug well constructed and explain how do they function using suitable diagram.
- 6 (a) Distinguish with sketches, the difference between an unconfined aquifer and a confined aquifer.  
(b) What is meant by the term "radius of influence"?  
(c) An unconfined aquifer has thickness of 35m. A fully penetrating 25 cm diameter well in this aquifer is pumped at a rate of 40 liters per second. The drawdown measured in two observation wells located at 10 m and 100m from well are 8.0 m and 0.5 m respectively. Determine the hydraulic conductivity of aquifer. At what distance from the well, the draw down is insignificant?