

Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
300 Level 2nd Semester Examination – January 2019
MRT 385-2 Groundwater Exploration Methods



Instructions

Duration: 02 hours

Number of questions: 04 (Four)

Number of questions to be answered: 04 (Four)

Mark allocation: 100

Illustrate your answers with sketches/diagrams where necessary.

Index Number:-



1.

- a. Briefly describe factors to be considered prior to planning a groundwater exploration survey. (5 marks)
 - b. What are the two categories where groundwater exploration methods are grouped into? What is the logical reason behind this categorization? (5 marks)
 - c. Why should a reconnaissance survey be carried out? Discuss in detail. (10 marks)
- (Total 20 marks)

2.

- a. List the logical approach of groundwater exploration. (5 marks)
 - b. How are steps of a logical approach connected? Describe with one example. (10 marks)
- (Total 15 marks)

3

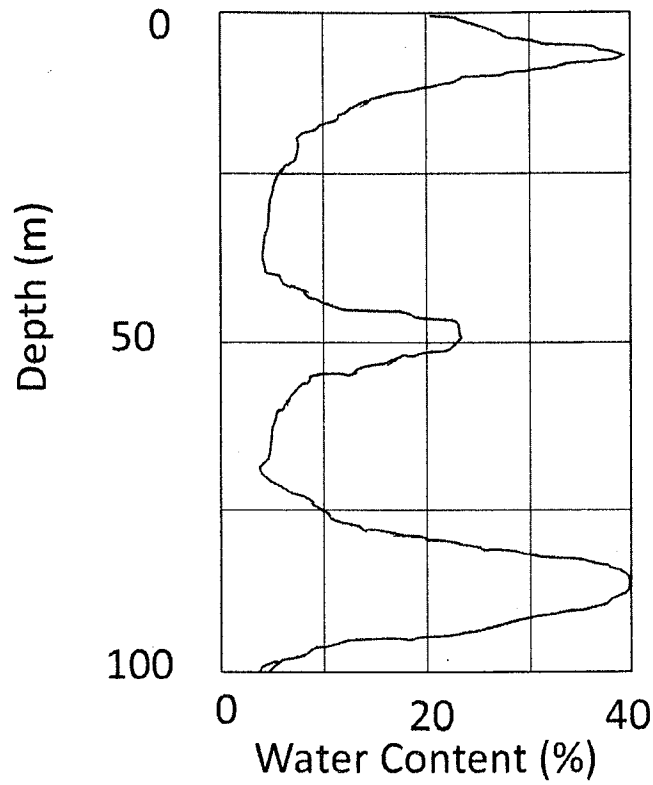
- a. "Electrical resistivity is the widely used geophysical method in groundwater exploration". Discuss this statement. (5 marks)
- b. What are the factors to be considered when a locality is selected for groundwater exploration using resistivity method? Briefly describe. (5 marks)

- c. i. What kind of electrode arrays are used for lateral profiling and vertical electrical sounding? What are the most efficient arrays for each survey? Discuss in detail. (5 marks)
- ii. A flat terrain with no significant morphological features has been selected for a resistivity survey. What strategy would you implement to locate the well location (5 marks)
- e. i. How would you identify a current leakage in a resistivity survey? (10 marks)
- ii. What kind of strategy should be implemented if the ground is too resistive to pass current through current electrodes? (10 marks)
- (Total 40 marks)

4.

- a. Describe the principle of nuclear magnetic resonance method. (5 marks)
- b. Compared to 1D resistivity method, what are the advantages and disadvantages of SNMR method? (5 marks)
- c. Draw the Signal vs Pulse Moment graphs for following ground conditions
- i. Shallow thin aquifer
- ii. Only an aquitard
- iii. Deep thick aquifer
- iv. Two aquifers (10 marks)

- d. Describe the ground condition based on the following figure resultant from a SNMR survey. (5 marks)



(Total 25 marks)

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