MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2015/2016

FOURTH YEAR SECOND SEMESTER EXAMINATIONS FOR THE
DEGREE OF BACHELOR SCIENCE IN EARTH SCIENCE WITH
INFORMATION TECHNOLOGY

MAIN CAMPUS

NGA 414: WATERSHED MANAGEMENT

Date: 18th April, 2016

Time: 11.00 - 1.00 pm

INSTRUCTIONS:

- Answer question ONE and any other TWO questions.
- Sketch maps and diagrams should be used whenever appropriate.

NGA 414: WATERSHED MANAGEMENT

1. a) Describe the need and scope of a watershed development management plan
(6 marks)

   b) Write short notes on the following:

      i) Principles of watershed management (4 marks)

      ii) Land suitability classification (4 marks)

      iii) River training (4 marks)

   c) Describe watershed characteristics and their significance in watershed function
(6 marks)

   d) Derive the relationship between drainage density and stream frequency of the basin using the following data;

Drainage density (km/km²)	2	5	7.5	10	12	15
Stream frequency (F)	6	20	35	50	72	90

(6 marks)

2. a) Explain the importance of soil conservation in watershed management
(10 marks)

   b) Examine the role and significance of stakeholder participation in watershed management and planning. (10 marks)

3. a) Examine strategies that can be used to successfully manage transboundary watersheds (12 marks)

   b) Explain factors affecting watershed management and planning (8 marks)

4. a) Assess the impact of climate change on watershed management (12 marks)

   b) Examine the significance of Geographical Information System (GIS) as a tool in watershed management and planning (8 marks)

5. a) Discuss the significance of an ecosystem in a watershed management program (10 marks)

   b) Explain engineering options applicable in addressing flooding problems in a watershed (10 marks)

6. a) Discuss the significance of integrated watershed management (12 marks)

b)   Using the data below, derive the relationship between discharge and its
     contributing area

Drainage area, (ha)	50	120	175	225	400	500
Average discharge, $Q(m^3/s)$	2	4.5	7	8.9	10.2	12

(8 marks)