MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2015/2016

THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN EARTH SCIENCE WITH INFORMATION TECHNOLOGY

MAIN CAMPUS

NGA 301: SURFACE WATER HYDROLOGY I

Date: 6ᵗʰ January, 2016

Time: 2.30 - 10.30pm

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

NGA 301: SURFACE WATER HYDROLOGY I

1. a) Describe a storm hydrograph. (8 marks)

   b) The following velocities were recorded in a stream with a current meter. Depth of flow at the point was 5m.

Depth above bed	0	1	2	3	4
Velocity (m/s)	0	0.5	0.7	0.8	0.8

   Find the discharge per unit width of a stream near the point of measurement using:

       i. Two point method. (3 marks)
       ii. Three point method (4marks)

   c) Discuss modes of sediment transport. (8 marks)

   d) Explain the infiltration scenarios. (7 marks)

2. Examine types of open channel flow. (20 marks)

3. a) Discuss the importance of interception. (8 marks)

   b) Explain six factors that influence interception capacity and loss. (12 marks)

4. a) Examine types of streams. (20 marks)

5. a) Discuss types of water erosion in a river a catchment. (10 marks)

   b) Examine major signs of soil erosion in a river a catchment. (10 marks)

6.   a)   Explain steps involved in river discharge measurement using a
         current meter.   (10 marks)

     b)   The following data were collected from a certain stream at a gauging
         station. Compute the discharge and mean velocity.
         (10 marks)

Distance from the river bank (m)	Depth (m)	Velocity (m/s)
3	1.4	0.122
6	3.3	0.223
9	5.0	0.236
12	9.0	0.259
15	5.4	0.236
18	3.8	0.234
21	1.8	0.158