



MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2013/2014

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

(MAIN CAMPUS)

NGA 304: WASTEWATER TREATMENT

Date: 2nd April, 2014

Time: 8.30 -10.45am

INSTRUCTIONS:

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



NGA 304: WASTEWATER TREATMENT

1. a) Describe any five constituents of sewage. (10marks)
- b) Explain the importance of the following in wastewater treatment
 - i) Biological Oxygen Demand (3 marks)
 - ii) Composting (3 marks)
 - iii) Aerobic digestion (3 marks)
- c) Explain five situations that may necessitate pumping of sewage in sewerage systems (5 marks)
- d) Explain how wastewater treatment is achieved in a facultative pond (6 marks)
2. a) Discuss the processes of waste water treatment in waste stabilization Ponds. (15 marks)
- b) Explain any five advantages of Waste Stabilization Ponds (5 marks)
3. a) Discuss activated sludge process in biological treatment of waste water (15 marks)
- b) Explain some of the principles considered in the design of sewers (5 marks)
4. a) Write short notes on the following:
 - i) Physical characteristics of wastewater (4 marks)
 - ii) Trickling filtration in wastewater treatment (4 marks)
 - iii) Sludge conditioning (4 marks)
- b) Differentiate between combined and separated sewers as encountered in sewerage systems (8 marks)
5. a) Discuss the layout of a conventional wastewater treatment plant (10 marks)
- b) Explain the causes of inefficiency in sewage treatment systems (10 marks)
6. Discuss the benefits realised from anaerobic waste treatment (20 marks)