



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

INSTITUTIONAL BASED PROGRAMME (IBP) – DECEMBER 2011 SESSION

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

ENVIRONMENTAL HEALTH

HEH 309: LIQUID WASTE MANAGEMENT

DATE: Thursday, 3rd May, 2012

TIME: 8.00 a.m. – 10.00 a.m.

INSTRUCTIONS:

- Answer **ALL** questions in Section A.
- Answer question **TWO** and any other **TWO** questions in Section B.

SECTION A

Answer **ALL** questions in this Section. Each correctly answered questions earns 4 marks.

- a) State four measures of strength of sewage. (4 marks)
 - b) Distinguish between prototrophic and metatrophic bacteria as used in sewage treatment. (4 marks)
 - c) Outline four basic features you would put in place in construction of stabilization ponds. (4 marks)
 - d) Define the following terms as used in liquid waste management.
 - i) Activated sludge (1 mark)
 - ii) Mineralization (1 mark)
 - iii) Ammonia stripping (2 marks)
 - e) Outline four ways in which liquid waste treatment plant can generate revenues apart from levying their clients. (4 marks)

SECTION B

- Answer question **TWO** and any other **TWO** questions.
 - Question **TWO** carries 20 marks, the other questions carry 15 marks each.
2. You are an officer in charge of a sewage treatment plant. Kenyatta University Environmental students on fieldtrip visit your facility with an aim to observe treatment process. Using a flow diagram, explain the various major stages that sewage should pass before the treatment process is complete. (20 marks)
 3. Discuss the emerging advances in eco-friendly sewage treatment that are being experimented on in several countries. (15 marks)
 4. Water supply as a resource in many cities does not match with the rate of city expansions. For that reason, many developers are considering recycling liquid waste water.
 - a) Describe some probable uses of recycled water. (5 marks)
 - b) Explain the tertiary treatment processes you would consider to put in place as measures of health – related considerations for the proposed recycling of liquid waste water. (10 marks)
 5. Giving reasons for each stage, describe the process through which liquid waste water is taken through preliminary treatment. (5 marks)