



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY**  
**SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES**  
**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN**  
**BIOLOGICAL SCIENCES**  
**4<sup>TH</sup> YEAR 2<sup>ND</sup> SEMESTER 2018/2019 ACADEMIC YEAR**  
**MAIN CAMPUS - REGULAR**

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**COURSE CODE:** SBI 3444  
**COURSE TITLE:** ENVIRONMENTAL MICROBIOLOGY  
**EXAM VENUE:** BIO LAB **STREAM:** (BIO)  
**DATE:** 29/04/2019 **EXAM SESSION:** 12.00-2.00PM  
**TIME: 2 HOURS**

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**Instructions:**

- 1. Answer ALL questions in Section A and Any two questions in Section B**
  - 2. Candidates are advised not to write on question paper**
  - 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**
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### SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)

1. Outline the process involved in the treatment of commercial sewage during the primary, secondary, and tertiary stages (3 marks)
2. Explain the meaning of Biological Oxygen Demand, and outline the test used to determine it. (3 marks)
3. Assess the importance of biofilms in a watery environment (3 marks)
4. List three major steps involved in the purification of water by local municipalities (3 marks)
5. Assess the importance of soil filters in purification of organic wastes (3 marks)
6. Explain the idea behind hydrobotanic purification of wastewater (3 marks)
7. Outline six factors that affect self-purification of water (3 marks)
8. Explain three factors considered by municipal councils in the selection of methods for management of solid wastes (3 marks)
9. Explain the following methods of integrated solid waste management
  - i. Source reduction (1½ marks)
  - ii. Preprocessing of compost (1½ marks)
10. Give the rationale for the using indicator micro-organisms in water quality (3 marks)

### SECTION B: ESSAY QUESTIONS (40 MARKS)

11. Discuss the classification and pathogenicity of five microorganisms implicated in water-borne infections (20 marks)
12. Describe the chemical methods of wastewater treatment (20 marks)
13. Discuss five methods used in bioremediation of organic pollutants (20 marks)
14. Compare and contrast sewage ponds with trickling filters and activated sludge methods of sewage treatment (20 marks)