

**EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE IN MARINE RESOURCES MANAGEMENT**

AES 4317 : Marine Pollution and Management

Date: May 2016

Time: 2 hrs

Instructions: Question 1 is compulsory.

Choose and attempt TWO other questions from Question 2 to Question 5.

1. (a) Define the following terms;
 - (i) Point sources of water pollution (2 marks)
 - (ii) Diffuse sources of water pollution (2 marks)
 - (b) Describe the processes in natural waters that define the following terms;
 - (i) Biochemical Oxygen Demand (BOD) (4 marks)
 - (ii) Nitrogenous Oxygen Demand (NOD). (4 marks)
 - (c) Explain the application of the following terms in pollution management;
 - (i) Water Quality Criteria (WQC) (4 marks)
 - (ii) Water Quality Standards (WQSs). (4 marks)
 - (d) List any TWO greenhouse gases, indicating their sources due to human activities. (2 marks)
 - (e) Give any FOUR water pollutants that are not removed during primary and secondary treatment of municipal wastewater. (2 marks)
 - (f) Explain the following terms;
 - (i) Transboundary pollution (3 marks)
 - (ii) Grasshopper effect (3 marks).
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2. (a) Highlight the sources and effects of the following marine pollution agents;
 - (i) Sediments (8 marks)
 - (ii) Noise (8 marks)
 - (b) State any TWO mitigation measures on formation of acid rain (4 marks)
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3. (a) Describe the term “performance standards”, with an appropriate example. (6 marks)
 - (b) Define the occurrences in a stream after the discharge of domestic sewage that define the former’s ability to self-cleanse (6 marks)
 - (c) Highlight the impact of ocean acidification (8 marks)
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4. (a) Identify types and sources of wastewater from an urban centre, indicating their compositions (6 marks)

- (b) Describe the process of secondary treatment of domestic wastewater (8 marks)
- (c) Highlight the impact of plastic waste on the marine environment (6 marks)
5. (a) Describe any THREE types of hazardous waste (6 marks)
- (b) Outline a suitable method for the treatment of oily shipboard waste or refinery sludge. (6 marks)
- (c) The Director General of Kenya Maritime Authority is empowered to regulate dumping of waste at sea and prevent marine pollution. Provide any TWO regulatory standards used by the Director General for each of the following;
- (i) Procedural standards for dumping waste at sea (4 marks)
- (ii) Design standards for prevention of marine pollution by ships (4 marks)