



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY  
SCHOOL OF HEALTH SCIENCES**

**UNIVERSITY EXAMINATION FOR DIPLOMA IN COMMUNITY HEALTH AND  
DEVELOPMENT**

**1<sup>ST</sup> YEAR 1<sup>ST</sup> SEMESTER 2023/2024 ACADEMIC YEAR**

**KISUMU**

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**COURSE CODE: HDC 2113**

**COURSE TITLE: WASTE MANAGEMENT**

**EXAM VENUE: STREAM: (Dip. Comm Hlth & Dev)**

**DATE: EXAM SESSION:**

**TIME: 1.30 HOURS**

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**Instructions:**

- 1. Answer all the questions in Section A and ANY other TWO questions in Section B.**
- 2. Candidates are advised not to write on the question paper.**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room.**

**SECTION A: ANSWER ALL THE QUESTIONS IN THIS SECTION (30MARKS)**

1. Define the following terms as used in waste management (3marks)
  - a) Liquid waste
  - b) Polluter pays principle
  - c) Sludge
2. Briefly explain any THREE types of health care wastes. (3marks)
3. Give THREE reasons for analyzing solid wastes in a fast-growing town. (3marks)
4. Describe THREE factors which affect the amount and characteristics of solid wastes in a community you live. (3marks)
5. Some people regard waste as useless materials but this not true. List THREE types of materials that can be salvaged from waste. (3marks)
6. State THREE importance of treating waste water in a community. (3marks)
7. Outline THREE types of conservancy systems and provide one advantage of each. (3marks)
8. Briefly explain any THREE principles of composting. (3marks)
9. Briefly discuss THREE adverse impacts of an incinerator. (3marks)
10. Differentiate between Re-duce, Re-use and Re-cycling in waste management. (3marks)

**SECTION B. ANSWER ANY TWO QUESTIONS (30MARKS)**

1. a) Discuss the principles solid waste management. (10marks)  
  
b) Discuss the benefits of sanitary land refill. (5marks)
2. a) Giving reasons, list and explain the factors to be considered when coming up an appropriate waste disposal facility. (10marks)  
  
b) Explain the importance of on-site handling of solid waste. (5marks)
3. a) Discuss the conventional stages of sewage treatment. (10 marks)  
  
b) Biochemical oxygen demand (BOD) can be defined as the amount of oxygen required to stabilize organic matter under aerobic conditions by action of bacteria and other micro-organisms. Discuss the importance of BOD tests. (5marks)

4. a) Waste hierarchy is the cornerstone of waste management. Discuss this statement. (10marks)

b) Discuss the challenges facing developing countries in waste management. (5marks)

## **COURSE OUTLINE**

### **INTRODUCTION**

- Overview of solid and liquid wastes in public
- Waste disposal methods in urban and rural areas;
- Disposal of corpses and dead animals
- Public health transmissions
- Design and construction of excreta disposal methods
- Disposal of liquid wastes; Industrial liquid wastes
- Sewage treatment process and its management
- Stream pollution
- Natural purifications
- Waste water treatment and waste water parameters
- River pollution control
- Preliminary and primary treatment
- Activated sludge
- Percolating filters
- Waste stabilizing ponds
- Aeration theory
- Removal kinetics
- Waste water treatment for small communities
- Industrial waste water treatment
- Anaerobic treatment
- Sea outfalls and tertiary treatment
- Sludge treatment and disposal