



# MACHAKOS UNIVERSITY

University Examinations for 2022/2023 Academic Year

SCHOOL OF AGRICULTURE, ENVIRONMENT AND HEALTH SCIENCES

DEPARTMENT OF HEALTH SCIENCES

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (PUBLIC HEALTH)

HPH 313: HAZARDOUS WASTE MANAGEMENT

DATE:

TIME:

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## Instructions:

This paper consists of two sections A and B

## SECTION A

- This section has one question
- The question is compulsory
- The question is 30 marks

## QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Explain what half-life times means in assessing radioactive substances (3 marks)
- b) Highlight two significant characteristics of hazardous biological wastes (3 marks)
- c) For the following waste identification numbers/codes indicate the characteristic of the waste as per the EPA classification
- EPA D001
  - EPA D002
  - EPA D003
  - EPA D004 (4 marks)
- d) Define a hazardous waste (2 marks)

- e) Identify two characteristics that determine the collection methods for an hazardous waste (2 marks)
- f) List four (4) details that would be included in the labelling of hazardous wastes (2 marks)
- g) Highlight the key reason for segregation of hazardous wastes. (2 marks)
- h) Identify six (6) types of hazardous e-wastes (3 marks)
- i) Highlight three (3) hazardous waste priorities (3 marks)
- j) List three (3) advantages of biological treatment of hazardous wastes (3 marks)
- k) Identify three (3) collection equipment and accessories for radioactive substances (3 marks)

**SECTION B: ANSWER ANY TWO QUESTIONS. EACH QUESTION CONTAINS 20 MARKS**

- **This section has four (4) questions**
- **Answer any two (2) questions**
- **Each question is 20 marks**

**QUESTION TWO (20 MARKS)**

- a) Discuss the sources of hazardous wastes (10 marks)
- b) Using a well labelled diagram, explain the concept of a landfill in hazardous waste disposal (10 marks)

**QUESTION THREE (20 MARKS)**

- a) Identify and explain three (3) physical treatment methods that are used in hazardous waste treatment (10 marks)
- b) Discuss the effects of hazardous wastes on human health and the environment (10 marks)

**QUESTION FOUR (20 MARKS)**

- a) Discuss the chemical treatment methods in hazardous waste management (10 marks)
- b) Explain the challenges facing hazardous waste disposal in Kenya today (10 marks)

**QUESTION FIVE (20 MARKS)**

- a) Discuss the processes of elimination, reduction and recycling as part of hazardous waste reduction and minimization (10 marks)
- b) Discuss the classification of hazardous wastes (10 marks)