

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**FACULTY OF APPLIED SCIENCES**

**DEPARTMENT OF ENVIRONMENTAL SCIENCE AND HEALTH**

**FINAL EXAMINATION**

**MANAGEMENT OF SOLID AND HAZADOURS WASTE: ESH 2203**

**May 2012**

**Time Allowed: 3 hours**

**Total Marks: 100**

**INSTRUCTIONS:**

**Answer any ALL questions in section A and ANY THREE (3) in Section B. Each question carries 25 marks.**

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**SECTION A**

**Question 1**

Describe the following properties of Municipal Solid Waste highlighting their importance in solid waste management.

- (a)Physical (10 marks)
- (b)Chemical (10 marks)
- (c)Biological (5 marks)

**SECTION B**

**Question 1**

The Bulawayo Municipality wishes to determine the composition of its residential waste stream.

- (a)Describe how this can be done. (15 marks)
- (b)Briefly discuss the potential challenges to the approach described in (a) and suggest possible solutions. (10 marks)

**Question 2**

Discuss giving examples the various sources and types of hazardous waste. (25 marks)

**Question 3**

(a) Describe how you would plan for a street cleaning programme for a city like Harare.  
(20 marks)

(b) Using technical explanations, distinguish between following terms: trash, garbage, refuse and rubbish. (5 marks)

**Question 4**

With the aid of illustrations, explain the materials flow and solid waste generation in a typical technological society. (25 marks)

**Question 5**

Discuss the various national (Zimbabwean), regional and International legal provisions for regulation of management of solid and hazardous waste sighting strengths and weaknesses.

**End of paper**

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**SUPPLEMENTARY EXAMINATION**

**MANAGEMENT OF SOLID AND HAZADOURS WASTE: ESH 2203**

**July 2012**

**Time Allowed: 3 hours**

**Total Marks: 100**

**INSTRUCTIONS:**

**Answer any FOUR questions. Each question carries 25 marks.**

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**Question 1**

Discuss the various solid waste transformations highlighting their importance.

**Question 2**

With the aid of illustrations discuss the functional elements of solid waste management.

**Question 3**

Discuss, highlighting examples, the limitations and advantages of the various methods of solid waste processing.

**Question 4**

- (a) Describe the main stages of the landfilling process. (10 marks)  
(b) Briefly discuss, with relevant examples, the major risk groups of health care waste. (15 marks)

**Question 5**

Discuss the major aspects to be considered in the planning and design of a sanitary landfill site.

**Question 6**

- (a) Describe the main components of Zero Waste Emission concept. (10 marks)  
(b) Briefly discuss the various types of waste collection systems used in solid waste management systems. (15 marks)

**End of paper**