

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR BACHELOR OF SCIENCE IN PUBLIC HEALTH

PUHE 252 – SOLID WASTE MANAGEMENT

STREAMS: BSC (PUHE) Y2S1

TIME: 2 HOURS

DAY/DATE:

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INSTRUCTIONS

1. Do not write anything on the question paper.
2. Mobile phones and any other reference materials are NOT allowed in the examination room.
3. The paper has three sections. Answer ALL questions in Sections I and II and ONE question in section III.
4. All your answers for Section I (MCQs) should be on one page.
5. Number ALL your answers and indicate the order of appearance in the space provided in the cover page of the examination answer booklet.
6. Write your answers legibly and use your time wisely

SECTION 1: MULTIPLE CHOICE QUESTIONS [10 MARKS]

1. Garbage and refuse generated in kitchens and other work areas should be collected and stored in properly designed and constructed water-proof garbage containers which should be located in cool places and on raised platforms. What is the minimum height of the platforms on which the solid waste storage containers should be kept?
 - a. At least 20 cm above ground level.
 - b. At least 30 cm above ground level.
 - c. At least 40 cm above ground level.
 - d. At least 50 cm above ground level.
2. An effective solid waste collection programme should not allow piling of wastes to levels likely to pose a health hazard to the environment and human health and therefore

should be designed to take into consideration the unique characteristics of different solid wastes. What is the average length of storage of mixed refuse?

- a. 4 days
- b. 1 days
- c. 3 days
- d. 7 days

3. Which one of the following statements correctly represents the meaning of trash

- a. Non-putrescible refuse (mostly dry material such as glass, paper, etc.) except ashes.
- b. Rubbish that includes bulky items such as old refrigerators, couches, etc.
- c. Nonhazardous solid waste that requires collection and transport to a processing or disposal site
- d. Putrescible wastes resulting from the growing, handling, preparation, cooking, and serving of food

4. Which one of the following is not an example of inorganic waste

- a. Glass
- b. Crockery
- c. Vegetables
- d. Tin cans

5. Expression of units of measurement is a very important factor in determining the generation rate of solid wastes. Which one of the following units is appropriate for expressing the generation rates for residential waste?

- a. kg/ ha/ day
- b. Kg/capita/day
- c. kg/km/day
- d. kg/m²/day

6. Fusing point of ash is the temperature at which the ash resulting from the burning of waste will form a solid (clinker) by fusion and agglomeration. What is the typical fusion temperature for the formation of clinker from solid waste?

- a. 1000°C to 1100°C.
- b. 1100°C to 1200°C.
- c. 1200°C to 1300°C.
- d. 1000°C to 1200°C.

7. Which one of the following is not a key method of on-site handling of solid wastes?

- a. Segregation
- b. Shredding
- c. Incineration
- d. Composting

8. Which one of the following statements represents a key feature in the curb/block solid waste collection scheme?
- Waste generators are responsible for bringing their waste to collection vehicles
 - Waste generators place the waste containers or bags in central collection points on a specific day for collection by external actors
 - Collection crews that go along with the collection vehicle are responsible for bringing out stored solid waste from the dwelling units
 - Waste generators store waste in communal collection points located in a public
9. Which one of the following statements best explains the meaning of “recycling” as used in solid waste resource recovery?
- Processing the material to make something different
 - Being used for the same purpose again (such as refilling a soft drink bottle)
 - Burning of waste so that the heat can be used (for example, for heating swimming pools, collecting the gas that is produced in sanitary landfills and use it as a fuel or to generate electricity.
 - Processing material so that it can be used again as the same material, such as the processing of waste paper to make pulp and then new paper
10. In solid waste management, siting of disposal sites is one of basic programs that has to be done with maximum precautions in order to minimize risks to the environment and human health. What is the minimum distance of a basic disposal site from a basic water source?
- 20 meters
 - 30 meters
 - 40 meters
 - 50 meters

SECTION II: SHORT ANSWER QUESTIONS [40 MARKS]

- Define the following terms
 - Garbage [2 marks]
 - Refuse [2 marks]
 - Rubbish [2 marks]
- Explain the public health importance of solid wastes [4 marks]
- Classification of solid wastes is an important factor in effective management of solid wastes. Giving examples, discuss at least five (5) different classifications of solid wastes [10 marks]

4. The key components of solid wastes can be categorized as either physical or chemical constituents, which vary based on a number of factors. Discuss at least five (5) local predictors of the composition of solid waste [10 marks]

5. A transfer station is one of the key functional elements of an integrated solid waste management programme. Describe the rationale and design factors of a transfer station [10 marks]

SECTION III: LONG ANSWER QUESTIONS [20 MARKS]

1. Incineration, devoid its shortcomings, is one of the commonly used methods of solid waste disposal in Kenya, and many other countries across the globe. Describe the application, design, and advantages and disadvantages of an incinerator [20 marks]

2. Sanitary landfill, is an effective and proven method for a permanent disposal of refuses. A properly operated sanitary landfill eliminates insects, rodents, safety hazards, fire hazards, and other problems that exist in open dumping. Describe the application, design, and advantages and disadvantages of a sanitary landfill [20 marks]