

HPD 3122 WASTE MANAGEMENT UNIVERSITY EXAMINATION

BSc. PUBLIC HEALTH AND BSc. COMMUNITY HEALTH AND DEVELOPMENT

1ST YEAR 2ND SEMESTER, AUGUST 2013 EXAMINATIONS

SECTION A: Answer *ALL* Questions

1. **Differentiate** between black water and grey water. (3 mrks)
2. Briefly **explain** the meaning of BOD and COD in water treatment processes. (3 mrks)
3. **Highlight** the possible facilities that may be used as on-site disposal options. (3 mrks)
4. **Define** the terms 'wastewater' and 'sewage treatment'. (3 mrks)
5. **State** any three constituents of sewage wastewater. (3 mrks)
6. **Outline** any three factors that influence the choice of sanitation technology. (3 mrks)
7. With an example of each, **identify** three groups of micro-organisms of concern to improper excreta disposal. (3 mrks)
8. **Name** any six possible types of household toxic materials. (3 mrks)
9. **What** is a biological reprocessing method in the concept of waste management? (3 mrks)
10. **Give** any three waste management methods that focus on sustainability approach. (3 mrks)

SECTION B: Answer *ANY TWO* Questions

Q1.

- a) **Differentiate** between aerobic digestion process and anaerobic digestion process in sewage wastewater treatment. (3 mrks)
- b) The objectives of sludge treatment are – the removal of part or all of water in the sludge to reduce its volume, and to reduce the decomposition of the sludge putrecible organic solids. **State** any five methods that would help to accomplish the above process in the sludge treatment. (5 mrks)
- c) **Identify** the three approaches that would be applied in the sewage wastewater treatment methods. (3 mrks)
- d) In each approach identified in Q1 (b) **describe** any three methods that may be applied in the treatment of sewage wastewater. (9 mrks)

Q2.

- a) The purpose of digestion, whether thermophilic or mesophilic, in sewage wastewater treatment is to reduce the amount of organic matter and the number of disease-causing micro-organisms present in solid particles. **Differentiate** between thermophilic digestion and mesophilic digestion. (2 mrks)

- b) Sewage wastewater treatment processes are designed to achieve improvements in the quality of the liquid water content. **State** *any four* materials intended to be reduced by treatment processes of sewage wastewater. (4 mrks)
- c) **Identify** the four steps necessary in the sewage wastewater treatment. (2 mrks)
- d) **Describe** *any four* possible plant devices in each of the first three stages in sewage wastewater treatment process. (12 mrks)

Q3.

- a) **Define** the term hazardous waste. (2 mrks)
- b) Characteristic hazardous wastes are materials that are known or tested to exhibit one or more of the four traits. Briefly **describe** the four major traits of hazardous waste. (4 mrks)
- c) Briefly **explain** *any four* types and/or examples of healthcare wastes. (4 mrks)
- d) While reduction and recycling are desirable options of waste management, they are not regarded as the final remedy to the problem of hazardous waste disposal. So there will always be a need for treatment methods for storage or disposal of hazardous wastes. Briefly **discuss** *any four* treatment methods applicable to hazardous wastes. (10 mrks)

Q4.

- a) **Define** the terms 'excreta disposal' and 'sanitation'. (3 mrks)
- b) With illustrations of a diagram, briefly **explain** the role of excreta in disease transmission.
(5 mrks)
- c) **Identify** *any four* major diseases caused by improper disposal of excreta, and in each highlight the possible route of transmission and the associated sign(s) and/or symptom(s).
(6 mrks)
- d) Briefly **discuss** *any two* dry (non-water) conservancy that would be used for excreta disposal systems. (6 mrks)