

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF SCIENCE IN PUBLIC HEALTH**

PUHE 253: LIQUID WASTE MANAGEMENT

STREAMS: BSC. (PUHE) Y1S1

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 24/3/2021

2.30 PM – 4.30 PM

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 ONE (Answer ALL QUESTIONS)

SECTION ONE (Answer ALL QUESTIONS) – (20 Marks)

Tick the right answer

1 What is the most common used coagulant?

- A. Alum
- B. Ferric sulphate
- C. Limestone
- D. Coal

2. Measuring BOD (biological oxygen demand) is primarily used for

- A. Estimating the types of microbes
- B. Determine the level of dissolved oxygen

- C. Estimating the quantity of organic matter in sewage water
D. None of the above
3. _____ devices remove materials which would damage equipment or interfere with waste water treatment process.
- A. Grit
 - B. Screening
 - C. Oxidation
 - D. Reduction
4. What are the structures that are constructed at suitable intervals along the sewerage system called?
- A. Manholes
 - B. Catch basins
 - C. Pumps
 - D. Sewer appurtenances
5. A masonry or R.C.C. chamber constructed at suitable intervals along the sewer lines, for providing access into them is called _____
- A. Inverted siphons
 - B. Manhole
 - C. Flushing tanks
 - D. Clean-outs
6. The heavy particles in the septic tank _____
- A. Float
 - B. Sink into the bottom
 - C. Separated using magnetic methods
 - D. Flow along liquid
7. What are the gas products of anaerobic digestion?
- A. Carbon-dioxide and methane
 - B. Methane and oxygen
 - C. Oxygen and carbon-dioxide
 - D. Nitrogen and methane
8. What is a sewer that runs full under gravity and flows at a pressure above the atmosphere in the sewer called?
- A. Flushing manhole
 - B. Inverted siphon
 - C. Siphon
 - D. Curb inlet
9. Which of the following statements related to the aerobic organic matter is true?
- A. Essential nutrients for growth
 - B. Development of sludge deposits
 - C. Growth of undesirable aquatic life
 - D. Development of septic conditions
10. Wastewater from different sources like bathrooms, kitchens and wash basins is called _____
- A. Sewage
 - B. Garbage
 - C. Sullage
 - D. Discharge.

11. What is night soil?
 - A Soil containing urea
 - B Human excreta
 - C Animal excreta
 - D Human excreta, animal excreta and urea
12. The addition of substances or energy forms that directly or indirectly alter the nature of the water body is called?
 - A Water contamination
 - B Water pollution
 - C Sanitation
 - D Water treatment
13. The optimum temperature for bacterial activity is in what range?
 - A 25-35 degree Celsius
 - B 50 degree Celsius
 - C 20 degree Celsius
 - D 40 degree Celsius
14. Which of these is used to remove odour?
 - A Ultrafiltration
 - B Pressure sand filter
 - C Activated carbon
 - D Nano filter
15. Energy may be recovered from sludge as _____
 - A Hydrogen gas
 - B Methane gas
 - C Air
 - D Liquid petroleum gas
16. The multiplication of _____ is encouraged by the addition of oxygen.
 - A Bacteria
 - B Aerobic bacteria
 - C Anaerobic bacteria
 - D Fungi
17. Which part of the tank is suitable for anaerobic bacteria to flourish?
 - A Top
 - B Bottom
 - C Sides
 - D Middle zone
18. _____ is an aerobic process of mixing sewage sludge with agricultural by-product sources.
 - A Aerobic digestion
 - B Anaerobic digestion
 - C Composting
 - D Incineration

19. The sewers should be laid _____
- A Below the building
 - B Side of the building
 - C Within the building
 - D Across the building

20. Indicate whether True or False. The chemical composition of wastewater naturally reflects the origin from which it came.
- A True
 - B False

(20 marks)

SECTION TWO (Answer ALL QUESTIONS)

1. Define the following terms: **(3 marks)**
- a) Combined sewer system.
 - b) Liquid waste management
 - c) Biochemical Oxygen Demand
2. Explain four characteristics of liquid waste. **(4 marks)**
3. Explain any four sewer appurtenances commonly used along the sewer line. **(8 marks)**
5. Explain the four stages of sewage treatment. **(8 marks)**
6. Differentiate between effluent and influent. **(3 marks)**
5. List four factors to consider when constructing a manhole wall. **(4 marks)**

(30 marks)

SECTION THREE (Answer ONLY ONE QUESTION)

1. Proper management of waste is very vital. What are the impacts of poor liquid waste management? **(20 marks)**
2. As the newly appointed Public Health Officer in Mwanga County, one of your main tasks is to ensure safe disposal of liquid waste in the county. What are the factors you will consider when selecting drain pipes that will be used in the construction of the county's drainage system? **(20 marks)**
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