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OF SCIENCE AND TECHNOLOGY**

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QUALIFICATION : BACHELOR OF ENVIRONMENTAL HEALTH SCIENCES	
QUALIFICATION CODE: 08BOHS	LEVEL: 5
COURSE: WATER AND SANITATION	COURSE CODE: WAS512S
DATE: JANUARY 2024	SESSION: 1
DURATION: 3 HOUR	MARKS: 100

SUPPLEMENTARY/SECOND OPPORTUNITY: QUESTION PAPER

EXAMINER: *MRS MOUYELELE HAUFIKU*

MODERATOR: *MRS CHARMAINE JANSEN*

INSTRUCTIONS:

1. Answer all questions on the separate answer sheet.
2. Please write neatly and legibly.
3. Do not use the left side margin of the exam paper. This must be allowed for the examiner.
4. No books, notes and other additional aids are allowed.
5. Mark all answers clearly with their respective question numbers.

PERMISSIBLE MATERIALS:

1. Non-Programmable Calculator

ATTACHEMENTS

1. None

This paper consists of 5 pages including this front page

SECTION A: SHORT ANSWER QUESTIONS**[40 MARKS]****QUESTION 1****[10 MARKS]**

1.0 Fill in the missing terms/concepts

- 1.1 _____ that portion of rain water which has percolated into earth to forms underground deposit or water bearing soil formation called aquifers. [1]
- 1.2 _____ Is that level in the earth's crust where all the voids in the soils and rocks are filled with water and from which water will flow freely. [1]
- 1.3 _____ is a measure of the amount of oxygen required to remove waste organic matter from water in the process of decomposition by aerobic bacteria. [1]
- 1.4 _____ Water is heated to steam, which is then cooled and collected as liquid, leaving behind microorganisms and many other contaminants. [1]
- 1.5 _____ Water is passed through a membrane filter with very small pores under high pressure to remove minerals and contaminants, including all microorganisms. [1]
- 1.6 _____ The most common route of transmission of gastrointestinal disease where the disease-causing organism is excreted in the faeces and faecal matter containing the causative organisms finds its way to the mouth of the same or another individual either. [1]
- 1.7 _____ a point where groundwater emerges at the surface of the ground), from where the water can be piped to consumers. [1]
- 1.8 _____ Excreta, water and other waste put down a drain. [1]
- 1.9 _____ simply means collecting, or harvesting, rainwater as it runs off from hard surfaces and storing it in a tank or cistern. [1]
- 1.10 _____ It is also called clarification. [1]

QUESTION 2**[10 MARKS]**

2.0 Define the following terms/concepts in the context of Water and Sanitation.

- 2.1 Aquifer [1]
- 2.2 Turbidity [1]
- 2.3 Filtration [1]
- 2.4 Ozonation [1]
- 2.5 Sewerage [1]
- 2.6 Sewer [1]
- 2.7 Permeable. [1]
- 2.8 Anaerobic pond [1]

- 2.9 Sanitation [1]
2.10 Black water [1]

QUESTION 3

[10 MARKS]

- 3.0 Choose the correct answer from the alternatives given. Write the question number with the correct letter to the answer.
- 3.1 According to the World Health Organization (WHO) the water source has to be within. [1]
- a) 1000 m of the house
 - b) 1500 m of the house
 - c) 200 m of the house
 - d) 3000 m of the house
- 3.2 Water that is free from pathogens which are introduced to the water through faeces, dirty containers and safe for drinking is called. [1]
- a) Palatable water
 - b) Potable water
 - c) Raw water
 - d) Colourless water
- 3.3 This hardness is due to the presence of carbonates of calcium and magnesium and can be removed by boiling. [1]
- a) Permanent hardness
 - b) Acute hardness
 - c) Reversible hardness
 - d) Temporary hardness
- 3.4 All the following are disadvantages of ground water, except. [1]
- a) Usually requires pumping for extraction
 - b) Likely to be contaminated by dust and dirt
 - c) May have a high level of bicarbonate, carbonate and chloride
 - d) Poor in oxygen content
- 3.5. This bacteria will be one of the first bacteria that will be present in the water should contamination occur, and they will be in much larger quantities than others. [1]
- a) Coliform
 - b) Giardia lamblia
 - c) Cryptosporidium
 - d) Hepatitis A

3.6 _____ are flagellated protozoa that are parasitic in the intestines of humans and animals. [1]

- a) Coliform
- b) Giardia lamblia
- c) Cryptosporidium
- d) Hepatitis A

3.7 _____ a parasite that is spread by the transmission of oocysts via drinking water which has been contaminated with infected faecal material. [1]

- a) Coliform
- b) Giardia lamblia
- c) Cryptosporidium
- d) Hepatitis A

3.8 This primary process in waste treatment consists of a fixed screen and a moving cutter to grind solids which are able to pass through the screen into smaller pieces about 0.3 cm in size or smaller. [1]

- a) Screening
- b) Grit removal
- c) Comminution
- d) Sedimentation

3.9 The waste stabilization pond that has a mixture of aerobic and anaerobic conditions is known as. [1]

- a) Anaerobic
- b) Facultative
- c) Maturation
- d) Waste

3.10 The following is a water-borne disease [1]

- a) Conjunctivitis
- b) Schistosomiasis
- c) Dengue fever
- d) Dysentery

QUESTION 4 [10 MARKS]

4.1 Mention any **five (5)** disadvantages of ground water. [5]

4.2 State any **five (5)** disadvantages of a Ventilated Improved Pit latrine. [5]

SECTION B: LONG ANSWER QUESTIONS

[60 MARKS]

Please answer ALL of the questions in this section.

QUESTION 5

[20 MARKS]

5.1 Describe the large scale surface water treatment processes.

[10]

5.2 Briefly explain why sewage is a public health concern.

[10]

QUESTION 6

[20 MARKS]

6.1 Define water sampling.

[2]

6.2 Explain any **eight (8)** purpose of collecting water samples.

[18]

QUESTION 7

[20 MARKS]

7.1 Outline the preventative measures of Cholera.

[10]

7.2 Explain how Schistosomiasis is transmitted/ life cycle.

[10]

END OF THE QUESTION PAPER