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QUALIFICATION : BACHELOR OF ENVIRONMENTAL HEALTH SCIENCES	
QUALIFICATION CODE: 08BOHS	LEVEL: 5
COURSE: WATER AND SANITATION	COURSE CODE: WAS512S
DATE: NOVEMBER 2023	SESSION: 1
DURATION: 3 HOUR	MARKS: 100

FIRST OPPORTUNITY: QUESTION PAPER

EXAMINER: *MRS MOUYELELE HAUFIKU*

MODERATOR: *MS 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 4 pages including this front page

SECTION A: SHORT ANSWER QUESTIONS**[40 MARKS]** **QUESTION 1****[5 MARKS]** —

1.0 Classify the following diseases as water-borne, water-washed, water-based and water-related

- | | |
|------------------------|-----|
| 1.1 Typhoid fever | [1] |
| 1.2 Conjunctivitis | [1] |
| 1.3 Louse borne typhus | [1] |
| 1.4 Schistosomiasis | [1] |
| 1.5 Dengue fever | [1] |

QUESTION 2**[5 MARKS]** —

2.0 Interpret the following abbreviations in the context of water and sanitation

- | | |
|----------|-----|
| 2.1 WASH | [1] |
| 2.2 CLTS | [1] |
| 2.3 MAWF | [1] |
| 2.4 VIP | [1] |
| 2.5 WHO | [1] |

QUESTION 3**[10 MARKS]**

3.0 Match the concepts in Column A to their most correct statement in Column B. Write on your answer sheet the concept number and the letter representing the correct statement.

1 mark each

No	COLUMN A	COLUMN B	
3.1	Impermeable	A	A hole dug in the ground serving as soak away
3.2	Colloids	B	Not allowing passage of a liquid.
3.3	Permeable	C	Water that is pleasant to drink because its taste is good but it may not be safe to drink.
3.4	Soak pit	D	Parasitic worm that grow and multiply in sewage and wet soil
3.5	Helminths	E	Able to be passed through or penetrated by a fluid.
3.6	Palatable water	F	Water is heated to steam, which is then cooled and collected as liquid, leaving behind micro organisms
3.7	Black water	G	It is also called clarification
3.8	Sedimentation	H	The means of collecting and disposing of excreta and community liquid waste in a hygienic ways as not to endanger the health of individuals.
3.9	Distillation	I	Disturbed, muddy appearance of water.
3.10	Turbidity	J	These are low diameter particles which are responsible for the turbidity or the colour of surface water

QUESTION 4**[10 MARKS]**

4.0 Differentiate between the following terms:

4.1 Water treatment plant and waste water treatment plant. [6]

4.2 Temporary and permanent hardness of water. [2]

4.3 Shallow well and deep well. [2]

QUESTION 5**[10 MARKS]**

5.1 State the **five (5)** main objective of water treatment. [5]

5.2 Mention any **five (5)** advantages of ground water. [5]

SECTION B: LONG ANSWER QUESTIONS**[40 MARKS]**

Please answer ALL of the questions in this section.

QUESTION 6**[20 MARKS]**

6.1 One of the main duties of a water supply provider is to ensure that a safe and plentiful water supply is available to all segments of a community at a reasonable cost. This may mean seeking new water sources to satisfy demand. Identifying potential new sources and assessing their viability prior to development is a skilled technical task that requires several different factors to be assessed. Briefly explain any **seven (7)** factors to be considered before developing a water source. [14]

6.2 Outline the methods of preventing water –related insect vector disease or water arthropod disease. [6]

QUESTION 7**[20 MARKS]**

7.1 Explain why pit latrines are not suitable in areas where the groundwater table is high. [8]

7.2 On-site sanitation is characterized by the collection and treatment of waste where it is deposited.

7.2.1 Outline any **six (6)** advantages of on-site sanitation systems. [6]

7.2.2 Outline any **six (6)** disadvantages of a septic tank as a common type of on-site sanitation systems. [6]

SECTION B: ESSAY QUESTIONS**[20 MARKS]****QUESTION 8****[20 MARKS]**

In water treatment, sedimentation, or the removal by gravitational settling of suspended particles heavier than water, is perhaps the most widely useful operation. The water is allowed to sit in a large settling tank. The heavier flocs settle to the bottom, forming sludge, which is later removed. This process effectively removes larger suspended particles and some organic matter. Discuss the factors that influence effective sedimentation processes. [20]

END OF THE QUESTION PAPER