

THE NATIONAL UNIVERSITY OF LESOTHO

BSc. ENVIRONMENTAL HEALTH

2nd SEMESTER EXAM – MAY, 2023

WATER SUPPLY AND SANITATION - EHS2306

DURATION: 3 HRS

MARKS: 100

**INSTRUCTIONS:**

Section A, choose one correct **letter** and write it next to the question.

Section B- Answer **ALL** the questions

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**SECTION A**

1. Water that is good enough to drink is called \_\_\_\_\_.
  - A. Potable water
  - B. Groundwater
  - C. Surface water
2. Which of the following can contaminate an aquifer?
  - A. Landfills
  - B. Agricultural activities
  - C. All of the above
3. What are disease producing bacteria called?
  - A. Parasites
  - B. Sour type microbes
  - C. Pathogenic
4. At the beginning of emergencies, the life and health of communities are protected through:
  - A. Provision of enough safe water for drinking, cooking and essential personal hygiene
  - B. Ensuring that people have soap for washing their hands
  - C. All the above
5. Which one of the following is not a water-washed disease?
  - A. Trachoma
  - B. Ulcers
  - C. Cholera
6. Which of the following chemical is sometimes added in the process of coagulation?
  - A. Aluminium oxide
  - B. Calcium chloride
  - C. Aluminium sulphate
7. The following causes alkalinity as well hardness in natural water:
  - A. Calcium carbonate
  - B. Magnesium carbonate
  - C. Both A and B
8. Which one of the following statements is correct?
  - A. Very high concentrations of cadmium and copper can cause nausea, vomiting & acute liver & kidney damage.

- B. Concentrations of zinc above 20mg/l may cause vomiting and nausea.
  - C. Both A and B
9. **Hardness of water does not:**
- A. Have any bad effect in boilers
  - B. Cause difficulty in the washing of clothes with soaps
  - C. Make it unfit for drinking
10. **Coliform bacteria are an indication of the presence of:**
- A. Radioactive wastes
  - B. Excess fertilizer
  - C. Human faeces
11. **Temporary hardness of water may be removed by:**
- A. Calcium hydroxide
  - B. Calcium carbonate
  - C. Calcium chloride
12. **Which of the following substances are commonly used in a filter?**
- A. Charcoal
  - B. Sand
  - C. Both A and B
13. **BOD of safe drinking water must be .... mg/l:**
- A. 0
  - B. 10
  - C. 5
14. **What is the permissible nitrites concentration in public water supplies?**
- A. 1 mg/l
  - B. 0 mg/l
  - C. 0.1 mg/l
15. **According to WHO, the soft water has 0 to \_\_\_\_\_ milligram per litre as  $\text{CaCO}_3$ .**
- A. 30
  - B. 60
  - C. 90
16. **The source of arsenic in water is:**
- A. Food Industry waste
  - B. Fertilizers
  - C. Sewage
17. **Surface water covers about ..... % of global fresh water composition.**
- A. 30.1
  - B. 1.2
  - C. 0.65
18. **..... rocks have pores that hold water.**
- A. Pervious
  - B. Porous
  - C. Impermeable
19. **Crop irrigation accounts for .....% of world's fresh water use.**
- A. 70
  - B. 50
  - C. 30
20. **Manmade sources of nitrates in surface water bodies include:**
- A. Septic tanks

- B. Igneous rocks
  - C. Plant debris
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## Section B

### Question 1

- a) Explain any two suitable methods for rainwater harvesting in rural areas. [4]
- b) With the help of chemical formula, show how:
  - i. Clark's reaction and; [6]
  - ii. Ion exchange, can remove water hardness. [6]
- c) After hard water softening, which health problems can possibly result from some removal process(es)? [6]
- d) Describe five benefits of Rainwater Harvesting. [20]

### Question 2

- a) Discuss the importance of water treatment before its supply to communities. [8]
- b) Write short notes on:
  - i. Disposal of screenings. [3]
  - ii. Break point chlorination. [4]
  - iii. Backwashing. [3]

### Question 3

Water resources and water supply are threatened by **pollution** and **urban growth** in a major town in a least developed country. How would the above problems be addressed, so that communities get sustainable supply of potable water? [20]