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UNIVERSITY EXAMINATIONS 2023/2024

THIRD YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN PUBLIC HEALTH

HPP 3316: WATER, SANITATION AND DRAINAGE

DATE: JANUARY 2025

TIME: 2 HOURS

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- a) Give two (2) main reasons why hand-dug wells become unsuitable as a source of potable water supply. (6 Marks)
- b) Define the term turbidity and explain its effect on drinking water quality? (6 Marks)
- c) Describe the purpose of free residual chlorine? State the allowable levels in times of waterborne diseases outbreak. (6 Marks)
- d) List down any three (3) advantages of slow (Biological) sand filter. (6 Marks)
- e) Describe briefly the terms below as applied to drinking water supplies:
 - i. Temporary hardness. (3 Marks)
 - ii. Permanent hardness. (3 Marks)

QUESTION TWO (20 MARKS)

With the aid of suitable sketches, describe how you would protect a spring that provides water for human consumption from environmental pollution. (20 Marks)



MUST is ISO 9001:2015 and



ISO/IEC 27001:2013 CERTIFIED

QUESTION THREE (20 MARKS)

Describe the occurrence and effect of iron and manganese in drinking water supplies stating the stipulated levels in Kenya drinking water quality standards.

How are the undesirable compounds of the two elements removed? (20 Marks)

QUESTION FOUR (20 MARKS)

Discuss in detail how the following situations occur in piped water supplies indicating their effect on water quality and possible solutions:

- a) Dead ends in piped water distribution systems. (8 Marks)
- b) Intermittent flow in piped water system. (12 Marks)