



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF AGRICULTURAL AND FOOD SCIENCES

**THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF
BACHELOR**

OF SCIENCE IN FOOD SECURITY - 2013/2014 ACADEMIC YEAR

PWE 3313: WATER, HEALTH AND SANITATION

Instructions:

1. This paper consists of **TWO** sections, **A** and **B**.
2. Answer **ALL** questions from section **A** and any **TWO** from section **B**.
3. Write all answers in the booklet provided.

SECTION A [30 MARKS]

Answer ALL questions.

1. Water should be protected, used, controlled, managed, conserved and developed in a sustainable and equitable manner for the benefit of all.
 - (a) Explain TWO ways in which these benefits are geared towards food security. [4marks]
 - (b) Explain how the following properties of water give it a unique role in the environment for suitability of life:
 - i) Thermal properties. [2marks]
 - ii) Solvency. [2marks]
 - iii) Miscibility. [2marks]

2. (a) In reference to self-cleaning capacity of water, describe the meaning of the following terms:
 - i) Hydrophobicity. [2marks]
 - ii) Lotus Effect. [2marks](b) Explain how the agricultural sector is affected by water use in other sectors. [8marks]

3. Describe the following classification of infectious diseases associated with water. In each case, give one example of the disease involved:
 - i) Water borne. [2marks]
 - ii) Water-washed. [2marks]
 - iii) Water-based. [2marks]
 - iv) Water-related. [2marks]

SECTION B [40 MARKS]

Answer ANY TWO questions.

4. (a) Explain FOUR factors you would consider when selecting a source of potable water. [8marks]
- (b) Describe FOUR reasons why it is desirable to treat water before human consumption. [8marks]
- (c) Explain FOUR changes that are likely to occur during transport and distribution of potable water from the Point of Treatment to the Point of Use. [4marks]
5. (a) Describe **Sanitation** and explain the significance of its concern for human health. [4marks]
- (b) Describe the following terms as used within the subject of Sanitation:
- i) Improved sanitation. [2marks]
 - ii) On-site sanitation. [2marks]
 - iii) Food sanitation. [2marks]
 - iv) Environmental sanitation. [2marks]
 - v) Ecological sanitation. [2marks]
- (c) With the aid of a labeled sketch, describe how waste water can be treated using lagoons. [6 marks]
6. (a) What is water pollution? Explain three types of water pollution. [8marks]
- (b) Water Quality Standards are the basic requirements - by KEBS and WHO – that Must be observed before considering water to be fit for human consumption. Explain the following elements of Water Quality Standards:
- i Physical Quality. [4marks]
 - ii Chemical Quality. [4marks]
 - iii Bacteriological Quality. [4marks]
7. Explain in details the processes involved in monitoring and detection of changes in water quality. [20marks]