**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF AGRICULTURAL AND FOOD SCIENCES**

**THIRD YEAR SECOND SEMESTER UNIVERSITY EXAMINATION FOR FOR B.SC. SOIL SCIENCE**

**2016/2017 ACADEMIC YEAR**

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**COURSE CODE: ALS 3321**

**COURSE TITLE: SOIL, WATER AND PUBLIC HEALTH**

**EXAM VENUE:** **GROUP: YEAR 3 SEMESTER 2**

**DATE:** **EXAM SESSION: REGULAR**

**TIME: 2 HOURS**

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**INSTRUCTIONS:**

1. **Answer ALL questions in section A and ANY other 2 Questions in section B.**
2. **Candidates are advised not to write on question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

## SECTION A [30 MARKS]

**Answer ALL questions from this Section.**

1. In view of soil and water sciences, describe FOUR Processes of public health risk assessment **(4 Marks)**

2. Briefly describe how multiplier effects of soil and water contamination may influence public health **(4 Marks)**

3. Describe the meanings of the following concepts as applies in the understanding of Soil Contamination: (i) Soil contaminant retention (ii) Soil contaminant release (iii) Microbial degradation **(6 Marks)**

4. Briefly describe the two broad ways in which polluted soil can be decontaminated **(4 Marks)**

5. Giving relevant examples in each case, distinguish between **Natural** and **Anthropogenic** input sources of trace elements **(6 Marks)**

6. Briefly describe the THREE major sources of Water Pollution **(6 Marks)**

## SECTION B [40 MARKS]

**Answer ANY TWO questions from this Section.**

7. Discuss how the following contamination agents may culminate into negative health effects on human health: (i) Heavy metals (ii) Organic chemicals (iii) Airborne dust (iv) Soil pathogens **(20 Marks)**

8. Discuss in details any FIVE industrial processes that cause soil contamination by organic or inorganic pollutants **(20 Marks)**

9. Describe how changes in (i) Groundwater quality (ii) Surface water quality and (iii) Rain water quality are caused by their varied water sources **(20 Marks)**

10. Over the last three decades there has been increasing global concern over the public health impacts attributed to environmental pollution. Dandora municipal waste dumping site in Nairobi is a source of environmental pollutants and public health impacts on the adjacent communities, affecting both soil and water. The site is about 8 Km away from the city centre and occupies about 30 acres of land. Surrounding the dump are the Kariobangi North and Korogocho informal settlements and the residential estates of Dandora and Babadogo. Some of the waste from the dump ends up into Nairobi River thus extending environmental and health risks to the communities living within the vicinity as well as those living downstream - who could be using the water for domestic and agricultural purposes like irrigation. Answer the following questions in contemplation of the above illustration: **(20 Marks)**

    i. Briefly describe categories of waste sources likely to be generated from the dumping site

    ii. Give examples of pollutants that are likely to constitute pollution loads at such site

    iii. Briefly describe the routes of exposure by toxicants that can be found in air, water and soil of this environment

    iv. Briefly describe the categories of the data you would require for planning the Dandora site remediation.

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