

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**SECOND YEAR EXAMINATION FOR THE AWARD OF  
BACHELORS DEGREE IN PUBLIC HEALTH**

**PUHE 256: ENVIRONMENTAL POLLUTION AND CONTROL**

**STREAMS: BSC (PUHE) Y2 S2**

**TIME: 2 HOURS**

**DAY/DATE: TUESDAY 6 /07/ 2021**

**11.30 AM – 1.30 PM**

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**INSTRUCTIONS:**

1. Do not write anything on the question paper.
2. Mobile phones and any other reference materials are NOT allowed in the examination room.
3. The paper has three sections. Answer ALL questions in Sections I and II and ONE question in section III.
4. All your answers for Section I (MCQs) should be on one page.
5. Number ALL your answers and indicate the order of appearance in the space provided in the cover page of the examination answer booklet.
6. Write your answers legibly and use your time wisely

**SECTION 1: MULTIPLE CHOICE QUESTIONS [10 MARKS]**

1. Which statement best defines a “quantitative pollutant”?
  - a) A pollutant which remains in the environment for a long period of time without any change in its original form
  - b) A man-made pollutant
  - c) A substance already in the atmosphere and only becomes a pollutant when their concentration surpasses the allowable limit.
  - d) A pollutant which remains in the form in which it was added to the environment
2. What is the estimated proportion of argon in normal dry tropospheric air?
  - a) 0.63%
  - b) 0.73%
  - c) 0.83%
  - d) 0.93%

3. What is the average pH of uncontaminated rain?
  - a) 4.6
  - b) 5.6
  - c) 6.6
  - d) 7.6
  
4. Which one of the following gases is not a key greenhouse gas?
  - a) Carbon dioxide
  - b) Methane
  - c) Ozone
  - d) Nitrogen
  
5. Particulate materials in air are classified mainly based on their size and form. What is the size of “dust” particles in air?
  - a)  $0.1\mu\text{m} - 10\mu\text{m}$
  - b)  $0.03\mu\text{m} - 0.3\mu\text{m}$
  - c)  $0.5\mu\text{m} - 3.0\mu\text{m}$
  - d)  $0.05\mu\text{m} - 1\mu\text{m}$
  
6. What is the meaning of “convection” as used in the meteorology of air pollutants?
  - a) The direct transfer of heat energy
  - b) The transfer of heat by physical contact
  - c) The transfer of heat by movement of warm air masses
  - d) The indirect transfer of heat energy
  
7. What is the maximum allowable limit for noise exposure in the workplace for a maximum duration of 8-hour working day?
  - a) 85 dB
  - b) 90 dB
  - c) 92 dB
  - d) 95 dB
  
8. Which one of the following compounds are key end products of aerobic decomposition
  - a) Carbon dioxide and Water
  - b) Nitrogen and Water
  - c) Oxygen and Water
  - d) Ammonia and Water
  
9. Which of the following organisms is used as an indicator organism for bacteriological measurement of water safety?
  - a) E. coli
  - b) V. Cholerae

- c) B. Anthracis
- d) E. Histolytica

10. Which one of the following is not a key heavy metal pollutant in water?

- a) Al
- b) Cd
- c) As
- d) Pb

**SECTION II: SHORT ANSWER QUESTIONS [40 MARKS]**

1. Define the following terms

- a) Environmental Pollution [2 marks]
- b) Risk [2 marks]
- c) Threshold dose [2 marks]

2. Pollutants can be classified into different groups based on various shared attributes. Explain the two classifications of pollutants based on the materials of the pollutant

[4 marks]

3. The range of water pollutants is vast, depending only on what gets "thrown down the drain." Discuss five (5) key types water pollutants.

[10 marks]

4. Dose-response evaluation is required both in determining exposure scenarios for the pollutant in question and in characterizing a health effect. Explain five (5) key characteristic of the dose-response relationship.

[10 marks]

5. Good air quality depends on pollution prevention and on limiting what is emitted. Explain five (5) key general ways of controlling air emissions.

[10 marks]

**SECTION III: LONG ANSWER QUESTIONS [20 MARKS]**

1. The release of pollutants to the soil, just like in the other components of the environment, usually originates from anthropogenic processes and even if some elements and compounds occur naturally in soils, human interventions are the main drivers of soil pollution. Discuss the characteristics and health effects of five (5) common pollutants of the soil.

[20 marks]

2. Water is one of the basic elements of life, but when polluted water can also be a major source of diseases to humans and other lives. In order to control water pollution, it is necessary to carry out routine water safety measurements. Discuss ten (10) key specific parameters used to measure pollutants in water.

[20 marks]