SECTION A

1. Air pollution is a growing concern in many urban areas around the world. It does not only affect human health but also has negative effects on the environment.

a. How does air pollution impact human health in urban areas, and what are some of the specific health concerns associated with prolonged exposure to polluted air?

b. In what ways does air pollution affect the environment beyond its impact on human health? What are some examples of ecological consequences resulting from high levels of air pollution in urban areas?

c. What role does oxygen from the air play in the process of rusting or corrosion, and what are the problems of such a product formed to the material it affects ?

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iii. Understanding the process of water and sewage treatment, outline the key steps involved in each step.

iv. Explain how the processes listed in (iii) help to remove contaminants and ensure the safety of water for human use.

3. Rocks are an essential part of the Earth's crust and play a significant role in shaping our planet's surface. The knowledge of how rocks are formed, their composition, and the process of weathering is crucial.

i. a) Explain the formation of igneous, sedimentary, and metamorphic rocks.

2. Water is a vital natural resource that plays a crucial role in our everyday lives. It undergoes various processes and treatments to ensure its availability and quality.

i.b) Appreciating the importance of water recycling, two natural processes that contribute to the recycling of water in the environment.

ii. Explain how these processes help maintain the water cycle and provide an example of each.

ii.identify the types of weathering and describe how each type contributes to soil formation.

4. Materials used in everyday life play a crucial role in various applications, and understanding their classification, physical properties, and environmental impact is important.

i. Differentiate between natural and synthetic materials Provide two examples of each type of material

ii. Polymers are widely used in everyday life due to their unique physical properties. Describe how the physical properties of polymers determine their uses in different applications, such as building materials, fabrics, and utensils used in homes.

iii. Common materials can have a negative impact on the environment when improperly disposed of. Explain how certain materials can pollute the environment

iv. explain the importance of recycling in overcoming the effect of pollution.

v. Provide two examples of materials that can be recycled.

5. Sophia is a young environmental scientist who is conducting an investigation in a polluted river. She collected samples of water, sediment, and debris from the river to analyze their composition. Help Sophia understand the nature of these substances and how they can be categorized by answering the following questions:

i. Sophia wants to determine whether the water sample she collected from the river is pure or not. Write the procedure she can use to determine the purity of the water sample

ii. As Sophia analyzes the composition of the river samples, she realizes that substances can be classified as elements, mixtures, or compounds. Help Sophia understand these classifications by showing what elements, mixtures, and compounds are. Provide one example of each to illustrate the concept.

iii. While conducting her investigation, Sophia notices that when she adds certain liquids together, they mix completely. However, when she adds other liquids separately from the first one, they form two distinct layers. Explain to Sophia why this occurs and provide two examples of a similar liquid combinations that result in a complete mixture and suggest examples of a mixture that form a distinct layer.

SECTION B. (Attempt any two questions)

6. In the year 2023, Uganda has made significant growth in sustainable agriculture, thanks to advancements in chemistry and inter-relationship with some other subjects such as agriculture. As a result, the nation's economy has witnessed high growth, and numerous career opportunities have emerged for individuals with a strong background in chemistry.

i. *In what specific ways have advancements in chemistry and inter relationship with other subjects like agriculture contributed to the growth of sustainable agriculture in Uganda?*

ii. *how has this positively impacted the nation's economy.*

7. In a high school chemistry laboratory, students are conducting an experiment to purify a mixture of substances. The teacher emphasizes the importance of laboratory rules, equipment usage, risk assessment, and proper actions in the prevention of an accident. The experiment involves identifying substances and determining their purity by utilizing their melting and boiling points.
"Imagine you are a student in a chemistry laboratory conducting an experiment to purify an impure water sample. Describe the step-by-step process you would follow to ensure that the purity of water is determined. Include the laboratory rules and regulations you need to adhere to, the laboratory equipment you would use and how you would use it appropriately, the importance of risk assessment in maintaining safety, and the actions you would take in the event of an accident.

8. During the chemistry analysis done s. 2 class students on one of their plantations in their garden, learners discovered that the samples from their analysis contained element X with atomic number 11 and it also contained element Y with atomic number 17.
   (i) Write electronic configuration of the atoms X and Y
   (ii) State the valency of an atom of the elements X and Y
   (iii) Using electronic structure, show how element X and Y can combine to form a compound.
   (iv) State the type of bond formed between X and Y (1 mark)
   (v) What are some of the properties of the type of bond being formed.

*END.