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Learner's Number.....Signature.....

KIYALA HIGH SCHOOL
END OF YEAR ASSESSMENT TEST 2024
CHEMISTRY
S.2

Time: 2 Hours

INSTRUCTIONS:

- This paper consists of *two* sections *A* and *B*. It has *five* examination items
- Section *A* is *compulsory*
- Responses to this section are to be written in the spaces provided in this booklet.
- Section *B* has *two* parts.
- Answer *two items* from section *B*, choosing *one* from *each* part.
- Responses to this item are to be answered in the answer booklet provided. ○ Any additional item answered will not be scored

SECTION A

Attempt all items in this section

Item 1:

Two boys from **Kiyala High School** were found fighting and they were given to dig a new rubbish pit. While digging the pit, they came across some substances from underground. On analysis, some substances gave a deep and ringing sound when struck while others could neither give a deep nor a ringing sound. The learners want to know more about the substance they found.



Task;

As a chemistry learner, help the boys to;

- a) Give the categories of the substances they found. (03scores)

The substances can be categorized as;

Metals ✓ C because they become stable by transfer of valence electrons ✓ R.

Examples include Iron, Aluminum. ✓ E. Total scores=03scores

- b) Take them through the suitability of the substances they found. (03scores)

Properties of iron.

Has a high melting and boiling point ✓

They are shiny and reflective. ✓

Malleable and ductile ✓

They are good conductors of heat and electricity ✓. Total scores=02scores

Give 01score for only 2properties.

Use of the substance

Used for making door and window frames ✓. Total scores=01score

- c) Advise them on whether the substances have impacts on the environment or not. (02scores)

Metals are non biodegradable, therefore deplete soil fertility affecting crop yields. ✓

Mitigation

Recycling ✓.

Total scores=02scores Item

2:

Tr. Aaron wishes to start up a textile industry to produce materials to be supplied to the nearby schools for making uniforms.

Tr. Aaron Knows that choosing a quality material depends on the properties of the material and has come to you for advice.



Task;

As a learner of chemistry;

- a) Explain the categories of the materials. (03scores)

Textile materials can be categorized into;

Natural materials, ✓C God made ✓R eg cotton, silk. ✓E. Total scores=03scores

- b) Advise him on the suitability of the materials for use. (02scores)

Properties of cotton

High absorbency ✓

Soft ✓

Elastic ✓

Flexible ✓.

Total scores=02scores, Give 01score for only 2properties.

- c) Advise him on the choice of these materials. (03scores)

The choice of the materials depends on the purpose they are meant to do and their impact on the environment.

Impact of cotton

Production of cotton involves the use of pesticides which lead water pollution during surface run offs, this leads to algal bloom(growth of algae in water bodies) depriving off oxygen to aquatic life hence death✓

Mitigation

Proper applications of fertilizers ✓

Use of cotton

Cotton is used for making T-shirts, sweaters.✓

Total scores=03scores

SECTION B PART I

Attempt any one item from this part.

Item 3:

Air which is a mixture of different components contains 21% oxygen. Due to a wide spread of respiratory illnesses caused by COVID-19, there has been an increased demand for oxygen by patients in hospitals. The government wants to set up an oxygen production plant in order to supply oxygen to be used in hospitals.



However, the community members want to know how the process of production will be carried out.

Task;

As a chemistry learner, write a message to your community members to address their concerns.

(08scores)

Oxygen is produced on large scale by fractional distillation of liquid air.

Atmospheric air is drawn into a filtration system to remove impurities✓ **like dust and water vapor. The air is then passed through concentrated sodium hydroxide to absorb carbon dioxide. It's also passed through silicon (IV) oxide(silica gel) to absorb water vapor,**

carbondioxide and water vapour are removed from the air before it's liquefied because when the air is compressed and cooled, they solidify and block the apparatus.✓

The clean air is then compressed to increase its pressure. The compressed air is cooled significantly, reducing its temperature to a point where it liquefies✓Cd. This typically involves using a series of heat exchangers and expansion valves.

The liquefied air is introduced into a fractional distillation column✓V, which is a tall tower with many trays or plates.

As the liquid air warms up in the distillation column, the different gases vaporize at their specific boiling points.✓Cp

Gases with lower boiling points, like nitrogen (-196°C), rise to the top of the column and are collected.

Gases with higher boiling points, like oxygen (-183°C), condense and collect at lower levels of the column.

Other gases, such as argon, are collected at intermediate levels.

The separated gases are further purified and stored in pressurized tanks for various industrial uses.✓Pr **Total scores=04scores** Side effects of the process of production

The process of air liquefaction and separation requires significant energy input✓ often derived from fossil fuels, contributing to greenhouse gas emissions hence global warming and climate change✓

Mitigation

Fitting catalytic converters on waste gas chimneys to help convert waste gas to less harmful ones ✓. **Total scores=03scores**

Other side effects

Oxygen, being a highly reactive gas, poses a significant fire risk. Any leak or accidental release can lead to fire or explosion✓ putting the life of workers at risk✓

Mitigation

Regular inspection and maintenance of apparatus to ensure they are in a good working condition✓

Liquid oxygen is extremely cold and can cause severe burns✓ upon contact with skin.✓

Mitigation

Personal Protective Equipment (PPE): Workers are required to wear appropriate PPE, such as protective clothing, gloves, and safety goggles.✓

Washing the affected part with clean running water several times.✓

Exposure to high concentrations of oxygen, especially at elevated pressures, can lead to oxygen toxicity✓, causing lung damage and other health issues.✓

Mitigation

Imposing warning signs in the working area ✓

Social benefits of the process of production

The plant will provide employment opportunities to residents, generating income hence improvement in standards of living ✓. **Total scores=01scores**

PART II

Attempt any one item from this part.

Item 4:

Fishing is a major economic activity done in most waters of Uganda. The Fishermen use a variety of methods in including local herbs and undersized Nets for fetching fish, some of the boat engines are old and pour oil on Water. Chemicals like detergents released directly in the water including some human wastes, factories around water showers release hot water and sewage into water bodies.



This has prompted the government to strictly over see the activity and ensure fishing is not contaminated and there is Market for it abroad. The head of the unit plans to sensitize the Fisher men. **Task;**

As a chemistry learner, help the head of the unit to sensitize Fisher men about the natural resource. **(08scores)**

Water is a renewable natural resource✓C, because it can be replaced by nature once used up✓R ,other examples of renewable natural resources include Air, Swamps✓E. 03scores

Water is composed of hydrogen and oxygen ✓Composition. 01score

Impact of human activities on natural resource

The release of oil from boats into water bodies cuts off oxygen supply ✓ to aquatic life when the oil spreads on water surface hence death of aquatic organisms, this disrupts the ecosystems ✓. **02scores**

Mitigation

Ensure the boat engines are serviced regularly before use to ensure no leakages ✓. **01score**

Benefits of the resource

Water serves as a habitat for aquatic life like fish hence protecting the ecosystem ✓

01score

Item 5:

There has been a rise in destruction of natural resources country wide for the last 10years and this has attracted the attention of the officials from National Environmental Management Authority (NEMA).



The officials are planning to sensitize the people country wide about sustainability of the natural resources through wide television broadcasts.

Task;

As a chemistry learner, prepare a write up you would deliver upon invitation as one of the presenters. **(08scores)**

Resources are classified as renewable and non renewable.

Renewable resources ✓ Category can be sustained ✓ Reason e.g. air, water, grass ✓ Examples.

Total scores=03scores

Air: is composed of Nitrogen, Oxygen, Carbon dioxide, rare gases, water vapour and dust in different proportions ✓ Composition. Total scores=01scores

Impact of human activities on the resources

Several activities impact negatively on natural resources for example Deforestation involves cutting down of trees which leads to loss of habitat ✓ for wild animals, hence loss of biodiversity. ✓

Mitigation:

Educating the society on the dangers of deforestation and encouraging reforestation ✓.

Total scores=03scores

Benefits of natural resources

Air is used for respiration. During respiration carbohydrate combine with oxygen in air to release energy and carbon dioxide used for proper body functioning. ✓.

Total scores=01scores

END

ANSWER THIS PAPER AS IF YOU'RE DOING UNEB