

PROPOSED GUIDE

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Index number...

545/1
CHEMISTRY
Paper 1
2024
2 hours

KANUNGU DISTRICT JOINT MOCK EXAMINATIONS 2024

Uganda Certificate of Education

CHEMISTRY

Paper 1

2 hours

INSTRUCTIONS TO CANDIDATES:

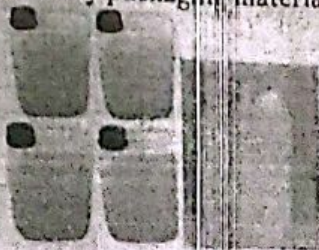
- This paper consists of two sections; A and B. It has six examination items.
- Section A has two compulsory items.
- Section B has two Parts; I and II. Answer one item from each part.
- Answer four items in all.
- Answers to Section A must be written in the spaces provided while those of Section B must be written on the answer booklet(s) provided.
- Any additional item(s) answered will not be scored.

SECTION A

Respond to **ALL** items from this section.

Item 1.

The coordinators of parish development model in Kanungu district recently cleared a group of female youths in the district to setup a liquid soap making project. However, the coordinators have cautioned the youths to use sustainable and environmentally friendly packaging materials of the product.



As a result, the youths have organized a meeting to discuss possible alternative packaging materials.

Task;

As a chemistry learner, write a short message you would deliver to the youths upon invitation. In your message:

(a) Explain

(i) categories of materials.

- Category
- Reason
- Example ✓

Synthetic materials / Artificial materials 03
Because they are made by man for example plastic, ~~contar~~ paper, ~~logs~~ glass, aluminium

(ii) the suitability of the materials.

Any 4 properties
Plastics are water-proof, resistant to chemicals, resistant to weather attack, very strong, light, durable if well maintained, poor conductor of heat, thermoplastics are recyclable, thermosets are tough / hard / stiff, non recyclable.
Paper is lightweight, cheap, tears easily, 03
not water proof.
Glass is transparent, brittle, strong, fire-resistant.
Aluminium is very strong, malleable, ductile, has high melting point, durable, light weight.

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(b) Advise the pupils on the choice of the materials.

Should use Thermoplastic because Thermoplastics are waterproof, resistant to chemicals and weather, recyclable and thus environmentally friendly. Thermoplastics are non-biodegradable, thus can pollute the environment if dumped. This can be mitigated by recycling.

- Reason for use - 01 score
- Danger - 01 score
- Mitigation - 01 score

(03) scores
- Accept all correct points
- Deny score for missing basis of assessment

Item 2.

James, a S.4 student at Kafu secondary school always visits his aunt, whenever he falls sick. He thinks and trusts his aunt's skill as a traditional healer.

One day, on his way from school with his brother, he slipped and fell down and felt pain on his head and also got some small cuts on his arm but had no bruises on his head.

His brother rushed him to one of the local health Centre, instead of taking her to his aunt's home. At the health Centre, he was given aspirin tablets.

To his surprise, after a rest he felt relieved from the pain. He has approached you to help him understand why the pain disappeared.

Task;

As a chemistry learner, write a message you will share with James. In your message, include:

(a) The category of the product.

Modern analgesic.

(02)

(b) The function of the product.

Stops inflammation, hence relieving pain.

(02)

Danger - 01
Mitigation - 01
Difference - 01
(c) Advice to James on the challenges associated with the use of the products. - 01

Some people are allergic to some modern analgesics which makes them lose concentration. This can be mitigated by using recommended dose, reducing use/stop using medicine that cause health risks.

04

Both modern and herbal analgesics relieve pain. Modern medicinal analgesics are more effective than herbal analgesics.

Accept alt similarities.
Accept alt. danger
Accept alt. difference.

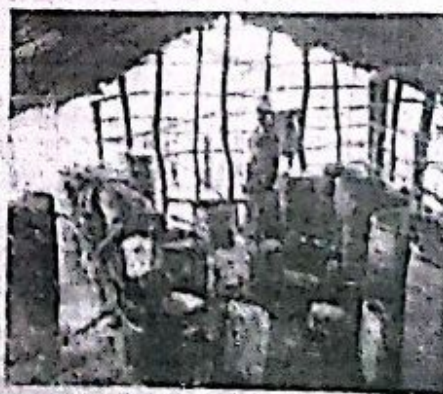
SECTION B

Part I

Respond to ONE item from this part.

Item 3.

Many people in villages around Kanungu district make a living by manufacturing waragi (ethanol) from locally available raw materials. However, the business is associated with challenges. The district LC5 chairperson wants to sensitize the community about the larger scale production process and its impacts.



The chairperson has contacted you as a student with the knowledge of chemistry in your village to provide relevant information.

Task;

Make a write up to use upon meeting the community people.

Item 3

Accept anyone starch containing material.

Raw materials: maize / cassava / banana, malt, yeast
millet 02

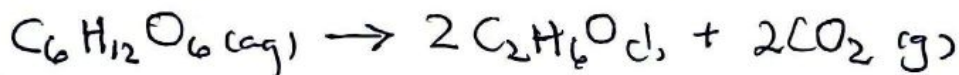
Process of production: The starch containing material is crushed (some are first roasted then crushed) to extract starch.

Vessels
- Convert
to desired
product
- purified
then

Malt is then added to starch in a container and it is then covered.

Malt contains diastase enzyme that catalyses hydrolysis of starch to maltose.

Yeast is then added to maltose after about three days at room temperature. The maltase in yeast catalyses the hydrolysis of maltose to glucose, Zymase enzyme in yeast catalyses the decomposition of glucose to crude ethanol and carbon dioxide. cd



Crude ethanol is converted to pure ethanol by fractional distillation. P

Danger + mitigation (Any one danger + mitigation) well explained

- When ethanol spills on surfaces, accidents may occur, causing injuries to the workers. Mitigation is by use of correct personal protective equipment 03
- Hot surface burns from distillation tanks that cause wounds hence pain to the workers. This can be mitigated by use of correct personal protective equipment

Social benefit (Any one social benefit) well explained

Employment opportunities; increased income; hence improved standards of living. 03

- Accept all correct points.
- Danger must be identified (01), explained (01) & mitigated (01)
- Social benefit must be identified (01) and explained (01)

Item 4.

Kihembe Sub County in Kanungu District Uganda is rich in iron deposits. The government is therefore planning to set up an iron and steel rolling factory to make the best use of the iron deposits in this village.

The local residents are however, protesting plan to establish the plant in their area, claiming that the government is going to steal their valuable land and there is no importance of a plant to them.



The locals also do not know how the process of extraction of iron will be done.

A radio talk show has been organised on one of the local radio stations by the District Development Officer (DDO) and the Local council representative to sensitise the locals on the issues at hand.

TASK

As a learner of Chemistry, prepare a presentation you would make upon invitation.

Part II

Respond to **ONE** item from this part.

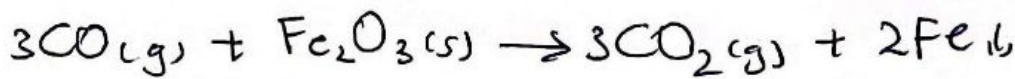
Item 5.

Kihihi town is an area developing at a fast pace. There are many trading centres that have been established in the different villages. Many swamps and forests have been reclaimed and filled with new buildings. Sand mining is the order of the day. Recently both the vegetation and wells have started drying up, and yet the little water that is available is not fresh. The few residents in the different villages that practice crop husbandry also say that seasons have changed and this has caused famine in some parts of the town. All these happenings have left many of the council officials wondering.

Item 4

Raw materials: Haematite, ~~the~~ coke and limestone. (02)

PP: Haematite, coke and limestone are fed into the blast furnace from the top. Hot air is blown from the bottom of the furnace, coke is oxidized by hot air forming carbon dioxide which reacts with unreacted coke reducing it to carbon monoxide. Carbon monoxide reduces haematite to molten iron and carbon dioxide given off in the process. (03)



- vessels
- conversion to desired prod
- purification

Limestone decomposes to calcium oxide and carbon dioxide. The calcium oxide formed reacts with silicon dioxide which is an impurity, forming calcium silicate that is tapped off.

Danger & mitigation.

Hot surface burns causing wounds hence risks to the workers. Mitigation is by use of personal protective equipment. (03)

- Only one well explained and mitigate
- Accept alt. correct point

Social benefit

- Employment opportunities; increased income hence improved standards of living. (03)

- Source of government revenue; improved social services hence better standards of living among residents.
- Only one well explained point.
- Accept correct alt. points



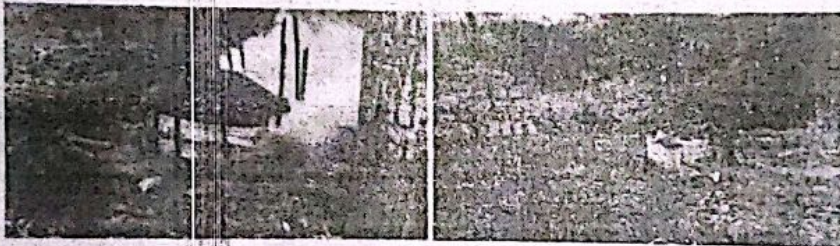
A sensitization workshop is to be organised by the Chairperson Local Council V through the different village environmental management committees.

Task;

As a learner of chemistry, present the message you will share when called upon.

Item 6.

As a result of increasing population in Butogota subcounty, many of the natural forests and swamps have been destroyed for create space for construction and provide charcoal among others. This has attracted the attention of the government officials in the district.



As a result, the government through the National Environment Management Authority (NEMA) is planning to create awareness to the people of Butogota Sub County through sensitization workshops organized in the different villages in the sub county.

Task

As a Chemistry learner, prepare a short presentation that you will deliver during the workshop when invited.

END

For item 5 and 6

140 $\frac{1500}{2500}$

Category:

Natural resources are categorised as renewable and non-renewable natural resources.

Renewable resources can easily be replenished for example water, air, trees and vegetation. (03)

Non renewable resources cannot easily be replenished. e.g rocks/minerals, petroleum and natural gas.

Composition (only for one example) (02) Any one

Air - nitrogen gas, oxygen gas, carbon dioxide, rare gases, water vapour

Water - Hydrogen & oxygen

Trees & vegetation - Carbon, hydrogen, oxygen, nitrogen

Rocks - Iron, copper, calcium carbonate, gold, cobalt

Fossil fuels - Carbon and hydrogen

Danger of human activities to natural resources. (Any one danger well explained and mitigated). (03)

- Destroying trees and vegetations lead to accumulation of carbon-dioxide in the atmosphere. Carbon dioxide being a green-house gas, it traps heat in the atmosphere leading to global warming. Mitigation is by increased afforestation, planting trees that grow and mature fast, which will use CO_2 for photosynthesis. Accept correct alt. point.

Social benefit (only one explained point is enough)

Air contains oxygen that facilitates aerobic respiration. During aerobic respiration, carbohydrates combine with oxygen in order to release energy to be used for proper body functioning. Accept all correct points.