

KIYALA HIGH SCHOOL

MID-TERM ASSESSMENT TEST 2025

CHEMISTRY

THEORY

S.4

Time: 2 Hours

INSTRUCTIONS:

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

Where necessary, use (Na=23, H=1, C=12, O=16, 1mole of any gas occupies 22.4dm³ at s.t.p)

Section A

(Attempt *all* items in this section)

Item 1:

Baking soda is a common ingredient in baking. It reacts with acidic ingredients in the batter to produce carbon dioxide gas, which helps the cake rise.

Chemical Reaction:



Akello, the manager at **PHASE-ONE** bakery is so cautious that she doesn't want the cake to over rise. She has purchased 15g of baking soda but is so inquisitive about the volume of the gas which is to be produced. She has contacted you for help.

As a learner of chemistry:

- (3 Scores)**

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- (5 scores)*

[illegible]

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d) Take her through the likely impacts of excess of the gaseous product on the atmosphere.

(3 Scores)

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Item 2:

You are a product development engineer for a leading athletic footwear company. Your team is tasked with designing a new line of running shoes specifically for long-distance trail runners. Your manager was told that polyurethane is the best for this but he has little knowledge about it.



Task;

a) Using your chemistry knowledge, guide your manager through;

i. The category of the product.

(3 Scores)

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ii. The suitability of the product.

(2 Scores)

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b) Suggest the would be impact of the Product on the environment. (3 Scores)

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Section B

PART I

(Attempt *only one* item from this part)

Item 3:

You are a newly hired chemical engineer at "Green Ammonia Inc.", a company pioneering sustainable ammonia production methods in Kumi district. Ammonia (NH₃) is a crucial chemical used in various industries, including fertilizers, pharmaceuticals, and even as a potential clean energy carrier.



A group of high school students from Kiyala High School are to visit the company.

Task;

Your manager has assigned you a critical task to help the learners in whatever information they will need, develop a concise and informative document outlining the step-by-step process of ammonia production for a group of high school students visiting the company. (11 scores)

Item 4

GreenFuel, a leading bioenergy company, aims to establish a large-scale ethanol production facility to meet growing demand for renewable energy. Ethanol is a vital biofuel, blending with gasoline to reduce greenhouse gas emissions, and dependence on fossil fuels. The US Renewable Fuel Standard mandates 15 billion gallons of ethanol production by May 2025.

Task;

As GreenFuels' process engineer, outline the ethanol production process, highlighting the environmental impacts of the process of production. (11 scores)

PART II

(Attempt *only one* item from this part)

Item 5:

The stone quarry generates a significant amount of waste, including rock dust, broken equipment, and packaging materials. Eva, concerned about the impact of this waste, decides to investigate more on rocks and what would happen to the community in a long run.



Task;

Create a presentation to educate the quarry workers and help Eva conclude with her investigation. *(11 scores)*

Item 6:

Peter is concerned about the potential impact of his cattle grazing and bush burning on the quality of the community water source. He decides to take the lead in monitoring the water quality. However, he has limited knowledge on natural resource and now he's fearful on how he's going to do this bold step. He has approached you as a knowledgeable person.

Task;

Write a presentation to clear off his fears. *(11 scores)*

SUCCESS