### ****KENYA JUNIOR SCHOOL EDUCATION ASSESSMENT****

### ****GRADE 9 – INTEGRATED SCIENCE (905/2)****

**Paper 2: Practical**  
 **Time: 1 hour 30 minutes**

#### ****NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****

#### ****SCHOOL: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****

#### ****STREAM: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****

#### ****DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_****

### ****INSTRUCTIONS:****

a) Write your name, school, stream, and date in the spaces provided.  
b) This paper consists of two questions: **Question 1 (20 marks) and Question 2 (10 marks).**  
c) Answer **BOTH questions** in the spaces provided.  
d) **Do NOT remove any page** from this question paper.  
e) All answers **MUST** follow the guidelines provided for each question.  
f) Answer the questions in **English**.

### ****LEARNER'S SCORE****

| **Task** | **Maximum Score** | **Learner's Score** |
| --- | --- | --- |
| TASK 1 | **20 marks** | \_\_\_\_\_\_\_\_ |
| TASK 2 | **10 marks** | \_\_\_\_\_\_\_\_ |
| **TOTAL** | **30 marks** | \_\_\_\_\_\_\_\_ |

### ****QUESTION ONE (20 Marks)****

**TASK 1 (20 MARKS)**

You have been provided with:  
i. A beaker  
ii. A tripod stand  
iii. A source of heat  
iv. A stopwatch  
v. Solution X

The following observations were made:

| **Time (Minutes)** | **Crystals begin to form** | **Crystals are halfway formed** | **All the liquid has evaporated** |
| --- | --- | --- | --- |
| k |  |  |  |

1. What is the method of separation used in the experiment? (2 marks)

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1. The crystals that form on the beaker are most likely to be those of what substance? (2 marks)

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1. What conclusions can be made about Liquid X? (2 marks)

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**d)** Apart from the method used in the experiment, name any other four methods of separation. (8 marks)

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**e)** Explain why heating was necessary in this experiment. (2 marks)

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**f)** Suggest one real-life application of this separation method. (2 marks)

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**g)** How can you improve the accuracy of the experiment? (2 marks)

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**TASK 2 (10 MARKS)**

You are provided with the following:  
i. A detergent  
ii. A bottle top  
iii. Mixing containers  
iv. Liquid Y  
v. Liquid Z

Use the procedure below to carry out the experiment:

a) Pour Liquid Y into the mixing container.  
b) Add a bottle top of detergent and mix well using your hand until a white substance is formed.

**a)** What happens when you mix Liquid Y with the detergent? (2 marks)

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d) Pour Liquid Z into the mixing container.  
e) Add a bottle top of detergent and mix well using your hand until a white substance is formed.

**b)** What happens when you mix Liquid Z with the detergent? (2 marks)

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**c)** From the experiment above, what can we conclude? (2 marks)

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**d)** What type of liquid is Liquid Y? (2 marks)

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**e)** State two advantages of using Liquid Z over Liquid Y. (2 marks)

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ANSWERS

**TASK 1: (20 MARKS)**

**a) What is the method of separation used in the experiment?**  
**Answer:** The method of separation used is **evaporation/crystallization**. (2 marks)

**b) The crystals that form on the beaker are most likely to be those of what substance?**  
**Answer:** The crystals are most likely to be those of **the solute present in Solution X**, such as **salt (sodium chloride) or sugar**. (2 marks)

**c) What conclusions can be made about Liquid X?**  
**Answer:**

* Liquid X is a **solvent that evaporates when heated**.
* It contains a **dissolved solid that forms crystals when the liquid evaporates**. (2 marks)

**d) Apart from the method used in the experiment, name any other four methods of separation.**  
**Answer:** (Any four, 2 marks each = 8 marks)

1. **Filtration** – Used to separate insoluble solids from liquids.
2. **Distillation** – Used to separate a liquid from a mixture based on boiling points.
3. **Chromatography** – Used to separate substances based on their movement through a medium.
4. **Decantation** – Used to separate liquids and solids by carefully pouring off the liquid.

**e) Explain why heating was necessary in this experiment.**  
**Answer:**  
Heating was necessary to **speed up the evaporation process**, allowing the solvent (liquid X) to evaporate and leave behind **pure crystals of the solute**. (2 marks)

**f) Suggest one real-life application of this separation method.**  
**Answer:**  
**Salt extraction from seawater** – Salt is obtained by evaporating seawater, leaving behind salt crystals. (2 marks)

**g) How can you improve the accuracy of the experiment?**  
**Answer:**

* Using a **precise stopwatch** to measure the time taken for evaporation.
* Controlling the **heat source** to ensure even heating.
* Using a **clean, dry beaker** to prevent contamination. (2 marks)

**TASK 2: (10 MARKS)**

**a) What happens when you mix Liquid Y with the detergent?**  
**Answer:**  
A **white substance (precipitate) forms**, indicating the presence of fats or oils. (2 marks)

**b) What happens when you mix Liquid Z with the detergent?**  
**Answer:**  
No white substance forms, suggesting that **Liquid Z does not contain fats or oils**. (2 marks)

**c) From the experiment above, what can we conclude?**  
**Answer:**

* **Liquid Y contains fats or oils**, as it reacts with the detergent to form a white substance.
* **Liquid Z does not contain fats or oils**, meaning it could be water or another liquid that does not react with detergent. (2 marks)

**d) What type of liquid is Liquid Y?**  
**Answer:**  
Liquid Y is **an oil-based liquid**, such as cooking oil or grease. (2 marks)

**e) State two advantages of using Liquid Z over Liquid Y.**  
**Answer:** (1 mark each = 2 marks)

1. **Liquid Z mixes easily with water**, making it easier to clean.
2. **Liquid Z does not leave greasy residues**, making it more convenient for washing.

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