Student's Name:	**Signature**:

ABDUL-RAHMAN BUN AUF ISLAMIC INSTITUTE NAMAGOMA

CHEMISTRY DEPARTMENT EXAMINATIONS BOARD

Uganda Lower Secondary Certificate of Education

S.1 MID-TERM EXAM

October, 2023

Morning (**Time**: **2 hours**)	**Paper reference**: **545/1**

Chemistry (Theory)
Paper: 1

Total Marks

INSTRUCTIONS:

- *Section* **A** *consists of* **10** *structured questions. Answer* **all** *the questions in this section.*
  Answers to these questions **must** *be written in the spaces provided in the question paper.*
- *Section* **B** *consists of* **two** *scenario questions. Answer* **only one** *question from this section.*
  Your answers to the question of your own choice **must** *be written in the answer sheet*(*s*) *provided.*
- *In both sections all working* **must** *be* **clearly** *shown in* **blue** *or* **black** *ink.*
  Poor handwriting may lead to loss of marks. Marks for each question are shown in **[ ]**
- *Any work done in pencil will* **not** *be marked* ***except*** *drawings and graphs.*
- *Mathematical tables and silent non-programmable calculators may be used.*
- *Periodic table is provided on the last page of this question paper.*

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1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**

SECTION A: 40 Marks
(Attempt all questions).

1. Table 1.1 below shows the boiling points of two gases **X** and **Y** which can be separated by fractional distillation method.

	Boiling Point
Gas X	-183
Gas Y	-196

Table 1.1

(a) Identify gases **X** and **Y** **[2]**

Gas **X-** _____

Gas **Y-** _____

(b) When the liquid mixture of gases **X** and **Y** is slowly warmed in the fractionating column, identify which of the two gases named in (a) above will boil off first **[1]**

_____

(c) Give any **one** use of gas **X** **[1]**

_____

2. Upon heating the mixture of iron and sulphur, Mr Juma was heard saying "the mixture first glows red and after sometime a black solid is formed which is not attracted to a magnet"

(a) Basing on Mr Juma's words, classify the black solid formed stating whether it's an element, compound or a mixture **[1]**

_____

(b) Also basing on Mr Juma's words, give reason(s) to support your answer in (a) above. **[3]**

_____

_____

_____

_____

_____

3. Figure 1.1 below shows a polymer.

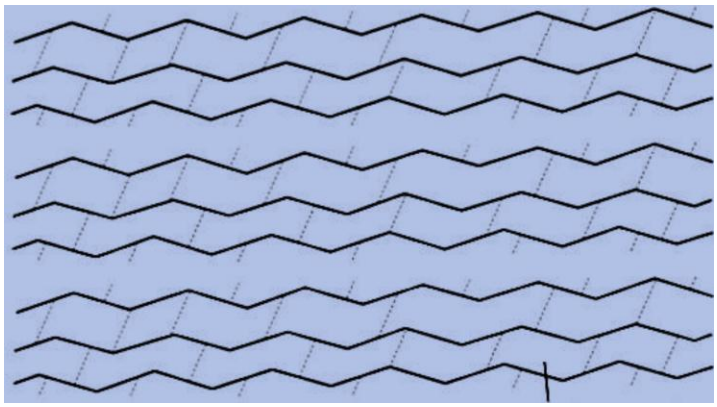


Figure 1.1

(a) State whether the polymer shown in figure 1.1 above is a natural polymer or man-made polymer. **[1]**

(b) State the **name** of the polymer shown in figure 1.1 above **[1]**

(c) Give any **one** use of the polymer shown in figure 1.1 above **[1]**

(d) What is a **polymer?** **[1]**

4. Being a central science, chemistry knowledge and application overlaps with most of other subjects in field of science. Give any **four** ways showing how chemistry knowledge is useful in improving agriculture sector in Uganda. **[4]**

5. Sodium chloride commonly known as table salt has a chemical formula **NaCl** where **Na** and **Cl** are symbols of certain elements.

(a) Identify the element represented by;

Na- _____ **[1]**

Cl- _____ **[1]**

(b) Which of the two elements above is a metal? **[1]**

_____

(c) State any **one** use of table salt at your home? **[1]**

_____

6. On a cold morning, Mr Njala opened a bottle of concentrated ammonia solution while in front of a chemistry laboratory and after 2 minutes, a student at the back of the laboratory smelled a pungent smell of ammonia gas.

(a) Give **one** word to represent the phenomenon shown by ammonia gas in the above scenario **hence** give its definition **[2]**

_____

_____

_____

(b) In the space below, draw the arrangement of ammonia gas particles in chemistry laboratory after the 2 minutes. **[1]**

(c) Estimate the time that would be taken by ammonia gas to reach the back of chemistry laboratory if Mr Njala opened the bottle in a hot mid-day environment? **[1]**

_____

7. Figure 1.2 below shows results of a certain paper chromatography experiment.

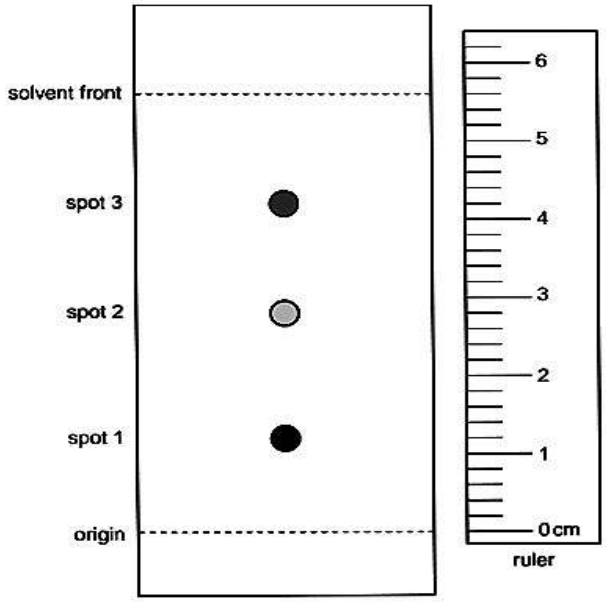


Figure 1.2

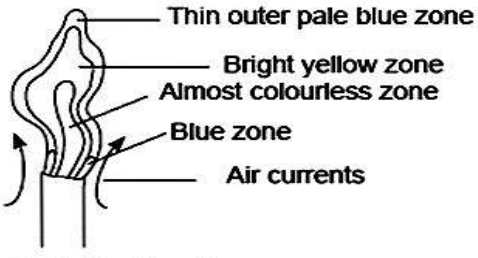
(a) Using the ruler on figure 1.2 above and the formula;

$$\mathbf{Rf} = \frac{\text{distance travelled by spot}}{\text{distance travelled by solvent}}$$

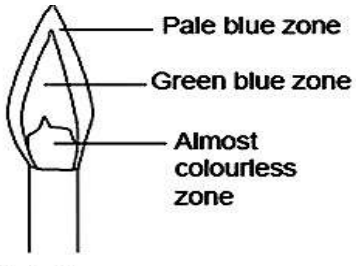
. Calculate the **Rf** value of spot 3 (*clearly show your working*) **[2]**

(b) Give any **two** examples of mixtures that can be separated using the method shown in figure 1.2 above **[2]**

8. Figure 1.3 below shows two types of flames produced when a Bunsen burner is lit while the air hole is closed and opened.



(a) Air hole closed



(b) Air hole open

(a) Identify which of the two types of flames shown in figure1.3 above is;

(i) Non-luminous flame_____ **[1]**

(ii) Luminous flame_____ **[1]**

(b) What is a **bunsen burner**? **[1]**

_____

_____

(c) Give any **one** reason why a bunsen burner is commonly used in chemistry laboratories **[1]**

_____

9. Outline the **four** main steps followed during managing fire outbreaks using a fire extinguisher. **[4]**

_____

_____

_____

_____

_____

_____

10. Table 1.2 below shows some components of air. Complete the table by writing the percentage composition of each component in air. **[2]**

Component	Percentage composition
Nitrogen	
Carbon dioxide	
Oxygen	
Noble gases	

(i) Which of the components shown in table 1.2 above turns lime water milky **[1]**

_____

(ii) Name any other **two** components of air other than those mentioned in table 1.2 above **[1]**

_____

SECTION B: 20 Marks (Attempt only one question)

11. **Context**

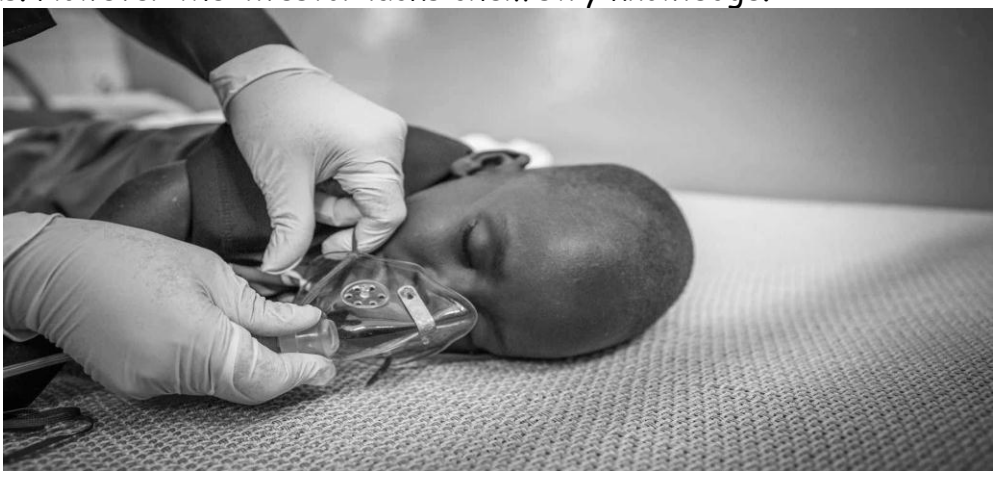
In an attempt to answer the un-ending cries of Katanga region citizens due to poor housing and accommodation facilities in their region, the government has intervened and decided to hire GM constructions company to build strong and durable accommodation houses for the citizens of Katanga region and has also cautioned this construction company not to use substandard building materials.

Task

As the chief engineer of GM Constructions Company, clearly write a brief report in order to convince the government that your company will construct good quality houses for the Katanga region citizens [20]

12. **Context**

Shortages of oxygen gas in Jinja hospital has led to rapid rise of death cases of patients with breathing difficulties, the citizens of Jinja have donated land near the hospital and the government has hired an investor to utilize the donated land in order to increase on the production of oxygen gas. However the investor lacks chemistry knowledge.



Task

As a chemistry scholar, guide this investor on how he can utilize the donated land to build an industrial plant clearly showing its constituent chambers and what possible activities to be done in each chamber in order to produce maximum oxygen needed by the patients in the hospital [20]

END.