

**P525/1
CHEMISTRY**

Paper 1
2 Hours



**CLEVERLAND HIGH SCHOOL-MAYA
END OF TERM I EXAMS-2025
SENIOR FIVE
CHEMISTRY
Paper One**

INSTRUCTIONS:

- **Answer all items**

Item one

A sample of chlorinated water was picked from Cleverland high school in Maya and analyzed by the senior five students in the laboratory using spectrometry. Results obtained showed that chlorine had three isotopes Cl-35, 35; Cl-35, 37; Cl-37, 37 and the spectrometer readings showed three peaks of 70, 72 and 74. The relative atomic mass of chlorine is 35.5. Students offering humanities who watched as they passed by the laboratory were much interested in the practicum lesson and requested for some explanation as to what was going on.

Task

As a senior five student who has some knowledge of spectrometry

(a) Explain to these students

i) Briefly what is spectrometry?

ii) Why were three peaks observed?

iii) Calculate the percentage abundance of each isotope of chlorine from the data

iv) Sketch the mass spectrum of the isotopes of chlorine.

Item two

A school garden at school usually gives poor yields. A soil sample analysis was carried out and results showed that the sample had deficient phosphorus.

Phosphorus among other uses, it is also important for proper plant root growth. An agricultural specialist from NARO based on the results has advised that a fertilizer with more phosphorus be added to the soil.

Task

You have been approached by the Agriculture students for some information about the following fertilizers; calcium phosphate, sodium phosphate and magnesium hydrogen phosphate

- a) Write the chemical formulae of the above fertilizers
- b) Using your knowledge of chemistry help the students make an appropriate choice for the best fertilizer to use in the school garden for increased yields

Item three

A packet of sugar manufactured by Kakira sugar works limited contains crystals of average mass of 3.42×10^{-3} g. The chemical formula of the crystal is $C_{12}H_{22}O_{11}$.

Task

You have been approached by a senior one student who would like to know more about the sugar crystal

- a) What do you understand by term Avogadro's constant?
- b) Write the chemical formula that is used to form the sugar crystal
- c) How many molecules will an average sugar crystal contain?

Item four

A rock sample from Maya quarrying site was picked by a worker and due to its attractiveness, thought was gold. He picked more interest and submitted it to the laboratory for analysis. It was later confirmed by the mineralogist that it was magnesium oxide as shown in the table below.

Table: Rock analysis results

| | Mass(g) |
|---|----------------|
| Mass of crucible and lid | 50.00 |
| Mass of crucible, lid and magnesium | 50.24 |
| Mass of crucible, lid and magnesium oxide | 50.40 |

Task

The worker who is also your guardian approaches you for guidance on how to determine mass of magnesium, oxygen and formula of magnesium oxide.

How would you go about it?

(Mg=24, O=16)

END