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545/1

CHEMISTRY (Theory)

Paper 1

S.1

2 hours

2022.

CHEMISTRY DEPARTMENT.

*Uganda certificate of Lower secondary education.*

END OF CYCLE EXAMINATION

DEPARTMENT OF CHEMISTRY

***Instructions.***

- This paper consists of two sections A and B.
- Attempt all questions from section A and any **TWO** in section B.
- Answers to section A must be written in the spaces provided.
- For section B, write answers on the answer sheets provided.
- Present your work neatly.

## SECTION A.

1. Harish group of company is an Indian company located in Uganda and deals with the production of many chemical products within Uganda, what are some of the chemical products produced by different companies in Uganda today. (4 marks)  
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2. Obang, s. 1 student carried out an experiment in the lab, He got two glass cups and labeled them A and B. and in cup A, he filled it with hot water and the cup B, he filled it cold water. He then immersed in each cup a tea bag. It took just 30 seconds for the hot water in cup A to change its colour and 60 seconds for water in cup B to change its colour.
  - i. Identify the property responsible for the colour change in both cups. (1 mark)  
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  - ii. Explain why it took a short time for hot water in cup A to change than the one in Cup B. (3 marks)  
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3. Sharifah, a senior two student wants to separate sand and water from their mixtures.
  - i. Identify the different methods of separation Sharifah will use to separate the mixtures. (1 mark)  
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  - ii. Briefly describe the procedures through which Sharifah shall follow to separate her mixtures. (3 marks)

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4. Three jars A, B and C are taken, jar A is half-filled with tap water, Jar B is half-filled with water which was boiled for a few minutes, Jar C is half-filled with the same boiled water as in B. in all the three jars, an iron nail is dropped, in jar C, after the addition of the iron nail, some oil is added so that a film covers the surface of water. The jars are kept for and opened after 10 days.

Observations: The nail in jar A is completely rusted.

The nail in B is slightly rusted.

The nail in C has not rusted at all.

- i. Identify the type of change being investigated in the experiment. (1mark)
  - .....
  - .....
  - ii. Give reason for the observations above? (3marks)
5. (a) Elements are made up of atoms, Atoms consist of subatomic particles.  
State the three sub atomic particles of an atom. (1. 5 marks)

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- (b) The table below shows the atomic numbers of three atoms

Atom	Atomic number	mass number
A	12	24
B	12	25
C	12	26

- i. Suggest, in terms of the number of subatomic particles, why the atomic numbers of the three atoms are the same . (1.5 marks)
- .....
- .....
- .....
- ii. Explain, in terms of the number of sub atomic particles why the mass numbers of the three atoms are different. (1 mark)

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6. A student wants to separated a mixture of ethanol, olive oil and water. Ethanol has a boiling point of  $78^{\circ}\text{C}$ , water has a boiling point of  $100^{\circ}\text{C}$  and olive oil has a boiling point of  $300^{\circ}\text{C}$ .

- i. Identify the method that can be used for the separation of these mixtures. (1 mark)

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ii. From the three substances, which liquid will be collected first. (1mark)

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Briefly explain why the three liquids shall be collected at different time interval. (2 marks)

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7. Previously in Uganda, petroleum has been discovered in the western region of Uganda. After the extraction of petroleum, how will the discovery of petroleum contribute to the development of Uganda. (4 marks)

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8. The knowledge of chemistry has improved peoples lives through manufacturing of medicines for treatment, detergents for cleaning to mention but a few, However its knowledge has also been misused in different. What are some of the different ways in which the knowledge of chemistry has been misused. (4 marks).

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9. Pounding a charcoal into little particles is possible but hammering an Aluminium into small particles is impossible.
- i. Which property of matter particles is demonstrated by these observations (1 mark)
- .....
- .....
- .....
- ii. Briefly explain why it is possible to crush or hammer charcoal and almost impossible to hammer a piece of Aluminium metal. (3marks)
- .....
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10. An atom X (atomic number 17) reacts with an element Y (atomic number 20) to form a compound.
- i. Identify the group and period into X belong to in the periodic table.
- .....
- .....
- ii. Classify X and Y as metal (s), non-metal (s) or metalloid(s)
- .....
- .....
- iii. Identify the type of bonding that will be formed between X and Y, Give reason for your answer.
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- .....

**SECTION B (30 marks). Attempt any two numbers**

11. Chemistry has contributed to society positively and negatively.
- (i) Explain the five ways in each case in which chemistry has contributed positively to the society and negatively to the society (10 marks)
- (ii) Identify five main sectors in the economy of Uganda where chemistry plays an important role (5marks)

12. During the chemistry tour which took place around lake Katwe, learners pick some of the samples of the water from lake with interest of identifying which elements are contained in the water sample they have got. They took the sample of the water for laboratory test and the result from the test showed that, the water sample contained an element X with atomic number 11 and it also contained element Y with atomic number 17.
- (i) Write electronic configuration of the atoms X and Y (2marks)
  - (ii) State the valency of an atom of the elements X and Y (1 mark)
  - (iii) Using electronic structure, show how element X and Y can combine to form a compound (5marks)
  - (iv) State the type of bond formed between X and Y (1 mark)
  - (v) Uganda as a country has benefited a lot from the discovery of salts in lake katwe. Explain how Uganda benefitted from the discovery of salts from lake katwe. (10 marks).
13. Recently, Uganda started rural electrification in different parts of the country, in mbogo which is one of rural area where electrification took place, two young children who stays in this area asked their father why is that the electric wire was appearing very tight in the morning yet the before when it was being laid the day before, the wire was loose.
- i. Assuming you were the father to these two young kids, explain using the knowledge of kinetic theory of matter why the electric wire looked tight in the morning yet during the day it was loose. (5marks).
  - ii. From our society, identify any other two items made using the knowledge of expansion and contraction. (2marks)
  - iii. Why is telephone/ electrical wire kept slightly loose when they are laid during hot days. (3marks)

- iv. How will the local community of these two kids benefit from the rural electrification project brought in by the government.

(10marks)

14. Salim was sent by his mother to buy a full bottle of paraffin at 2000 shs. On his way back, he found his friends playing and join them. While they were playing, one of the fiends accidentally knocked the paraffin bottle and poured the paraffin. The paraffin remained a half in the bottle. Due to fear of reaching home with a half of the original amount of paraffin, he poured water on to the bottle of water and filled it up again. On reaching home, his mother asked him who had poured water in the paraffin.

Task:

- (i) How did the mother know that Salim had poured water in the paraffin?  
(1mark)
- (ii) Identify the method that can be used to separate the mixture between paraffin and water and give reason for your answer (2 marks)
- (iii) Advice Salim's mother on the procedure she should follow in order to regain back the paraffin. (12marks)

**END**