

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION**

032/1

CHEMISTRY I
(For Both School and Private Candidates)

Time: 3 Hours

Thursday, 11th October 2012 p.m.

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** questions in this paper.
3. Calculators and cellular phones are **not** allowed in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).
5. The following constants may be used.

Atomic masses:

H = 1, C = 12, O = 16, N = 14, Na = 23, Mg = 24, Al = 26,
S = 32, Cl = 35.5, Ca = 40, Mn = 55, Fe = 56, Cu = 64.

Avogadro's number = 6.02×10^{23} .

GMV at s.t.p = 22.4 dm^3 .

1 Faraday = 96,500 coulombs.

Standard pressure = 760 mm Hg.

Standard temperature = 273 K.

1 litre = $1 \text{ dm}^3 = 1000 \text{ cm}^3$.



SECTION B (54 Marks)

Answer all questions in this section.

3. (a) With the help of chemical equation, what will be observed when ammonia reacts with:
 (i) Hydrogen chloride.
 (ii) Copper (II) oxide.
- (b) It is not advisable to sleep inside a house which is not well ventilated with a burning wooden charcoal. Give a reason for that and write the chemical equation to represent your answer.

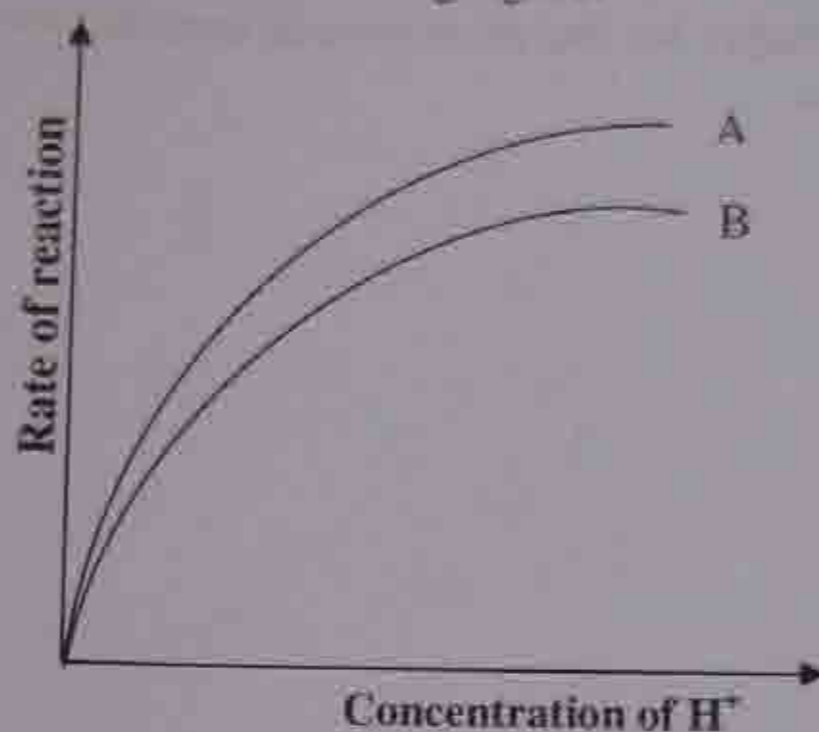
4. Study the following part of the periodic table and then answer the questions that follow:
Note: The letters used are not scientific symbols for the elements concerned.

Group							00
I	II	III	IV	V	VI	VII	
M						N	
	K				Q		P
L							

- (a) Identify and write down the electronic configuration for the elements K, N, P and L.
- (b) What type of bond will exist in a compound formed when Q combines with L? Write the chemical formula for the compound formed and list two chemical properties for the compound formed.
5. (a) A solution of sodium hydroxide was electrolysed using platinum electrodes. Write the reactions which took place at the electrodes and give a reason why the solution becomes alkaline.
- (b) Electric current was passed through a solution of sodium hydroxide using platinum electrodes. Draw a labelled electrolytic cell for this electrolysis. Indicate the directions of the movement of ions.
6. (a) Give the name of the process of making coke from coal. Write one characteristic which make coke a better fuel than coal.
- (b) (i) State the difference between physical strength and chemical strength of metals.
 (ii) Giving example, explain why preparation of metallic oxides by direct method is not intensively used.
7. (a) (i) People suffering from heart burn usually use wood ashes for relief. Mention characteristic which makes the ashes to be used for heart burn relief.
 (ii) Give four compounds found in laboratories which show the same characteristic as ashes.
- (b) How many molecules are there in 11.2 litres of carbon dioxide at STP?

8. (a) (i) Name the products formed when nitrates of potassium and zinc decompose by heat.
 (ii) Suggest why the nitrates of zinc and potassium behave differently on heating.
- (b) Mention two uses of sodium nitrate.

9. Two experiments were carried out using the same mass of magnesium ribbon and the same volume of acids of the same concentration. The acids were 1M hydrochloric acid and 1M ethanoic acid. The results were as shown in the following figure:



- (a) If the experiments were conducted within the same time, is there a difference in volumes of hydrogen gas collected at the same room temperature and pressure? Give reasons for your answer.
- (b) When same mass, volume and concentration of powdered magnesium and ethanoic acid are allowed to react, new graph is formed. Giving reason (s), suggest the position of that graph whether will be above, between or below graphs A and B.
10. (a) (i) Name three gases which should not be produced in order to prevent the destruction of ozone layer.
 (ii) List and explain three effects of ozone layer depletion.
- (b) Lack of safe water for domestic and industrial uses is a serious problem in most of Tanzanian towns. The major cause of this problem is pollution in the water sources. State three methods that could make water from a pond or a well be safe for drinking.
11. (a) The chemical properties of concentrated sulphuric acid can be grouped into oxidizing property and dehydrating property. In which property should sulphuric acid be grouped when it reacts with copper metal? Give reason and write the equation of the reaction.
- (b) The preparation of chlorine gas can be represented by the following equation: $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$. Calculate the number of moles of HCl which are needed to react with 20 g of MnO_2 and list two main chemical properties of chlorine gas.

SECTION C (28 Marks)

Answer all questions in this section.

11. Consider a four-carbon hydrocarbon (C_4H_x) where x is an integer. Give the name of homologous series, molecular formula and structural formula for different members of the compound formed by such hydrocarbon. In each case indicate the nature of isomerism.
12. Describe the common steps for the extraction of metals. Does the extraction of gold follow all the steps? Give reasons.