MYOTA·F.

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN SECONDARY EDUCATION EXAMINATION

732/1 CHEMISTRY 1

Time: 3 Hours *Monday, 17th May 2010 a.m.*

Instructions

1. This paper consists of sections A, B, and C.
2. Answer **all** questions in section A, and **two** (2) questions from each of sections B and C.
3. Section A carries 40 marks, section B carries 40 marks and section C carries 20 marks.
4. Cellular phones are **not** allowed in the Examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).
6. You may use the following constants:

   H=1, C=12, O=16, Na=23, S=32, Ag=108,
   1F=96,500C,
   e.c.e. of Zn=0.0135/g.
   RAM of Al=26.98,

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SECTION

Answer all questions in this section.

1. What is meant by the following terms:
   (a) Order of reaction
   (b) Hybridization
   (c) Ionization energy
   (d) Covalent bonding.

2. Explain why it is not recommendable to do the following in the laboratory.
   (a) To prepare primary standard solution of sulphuric acid from commercial sample.
   (b) To prepare primary standard solution of sodium hydroxide from sodium hydroxide pellets.
   (c) To add water into a concentrated acid.
   (d) To leave a container of sodium hydroxide solution uncovered.

3. (a) Define the term pH of a solution.
   (b) Calculate the molar concentration of H^+ ions in the solution which has 2.5×10^{-7} M of OH^- ions.
   (c) What will be the pH value of the solution in 3(b) above?

4. (a) What do you understand by the following terms as they are used in organic Chemistry?
      (i) Cracking
      (ii) Isomerism
   (b) Name the following Organic compounds
      (i) $CH_3\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2OH$
      (ii) $CH_3\text{-}CH{=}CH\text{-}CH_3$

5. (a) State Faradays second Law of electrolysis.
   (b) By passing a current of 0.65A for 35 minutes through water, Copper and Silver coulometers, the following masses of elements were liberated respectively 0.0143 g of H_2 gas, 0.114 g of O_2 gas and 1.542 g of Ag. Show that these results agree with Faraday's second Law of electrolysis.

6. (a) What is chemical kinetics?

(b) The decomposition of hydrogen peroxide to water and oxygen according to the reaction $2H_2O_2(\ell) \rightarrow 2H_2O_{(l)} + O_{2(g)}$ is a first order reaction with a rate constant of 0.0410/min.

(i) If its initial concentration is 0.50M, calculate its concentration after 10 minutes.

(ii) How long will it take for the concentration of hydrogen peroxide to drop from 0.50M to 0.10M?

7. (a) Define the terms:

(i) Titration

(ii) Standard solution.

(b) Describe briefly how to prepare sodium hydroxide solution for volumetric analysis purpose.

(a) What do you understand by the following terms?

(i) Period

(ii) Electronegativity

(b) How does the electronegativity of elements behaves

(i) down a group.

(ii) across the period.

(a) State the Le Chatelier's Principle.

(b) Consider the reaction equation below:

$A + B \rightleftharpoons C + D \qquad \Delta H = -X\ KJmol^{-1}$

From the equation, state what will happen if

(i) the concentrations of A and B are increased.

(ii) the temperature is lowered.

(a) What do you understand by the term standard solution?

(b) Outline six (6) apparatus commonly used in volumetric analysis.

SECTION B (40 Marks)

Answer two (2) questions from this section.

11. The following are scores of form two students in one of the secondary schools:
56, 54, 52, 50, 65, 67, 72, 81, 84, 86.

(a) Obtain the standard score for each student.

(b) Assume the national average is 50 and 10 is standard mark.

12. (a) What are the advantages of involving pupils in chemistry lesson preparation?

(b) Outline steps involved in modern scientific methods of teaching Chemistry.

(c) What problems are likely to occur if the teacher excute lesson without preparations?

13. Being a Head of Chemistry department, you have been given 24 hours advance examination instructions asking you to prepare exactly 15 litres of 0.119M sulphuric Acid from commercial acid with the following information: 96%, Density 1.82g/cm^3, Mwt 98.

(a) What precautions will you take in handling commercial sulphuric acid?

b) Explain the procedures you will adopt to prepare the required concentration.

(c) How much distilled water will you mix with concentrated acid given to get the required concentration?

(d) What volume of the dilute acid will neutralize exactly 25cm^3 of 0.125M sodium carbonate solution?

14. Although chemistry laboratory is potentially a dangerous place, fewer accidents do occur than elsewhere. Discuss the possible causes of accidents in the chemistry laboratory and how to prevent them.

SECTION C (20 Marks)

Answer two (2) questions from this section.

2. A Table of Specification is a very important tool in the setting of tests and examinations. Discuss.

3. Some teachers claim that preparation of a scheme of work is like duplication of the syllabus. Do you agree or disagree? Support your answer with concrete reasons.

4. After completion of your Diploma in Education course, you have been appointed by the Head of your School to be the Head of Chemistry Department. Prepare a job description for your newly employed labo:atory technician.

5. One of the mostly used teaching strategy is discussion. Explain its merits and demerits.