NAME……………………………………………………………ADM………

CLASS…………………………………………………………………………………………

FORM 2

233

CHEMISTRY

THEORY

2 HOURS

***INSTRUCTIONS TO STUDENTS***

1. Write your name and admission number in the spaces provided
2. Answer ALL the questions in the spaces provided
3. KNEC mathematical table and silent non-programmable electronic calculators may be used for calculations
4. All working MUST be clearly shown where necessary
5. Students should check the question paper to ascertain that all the pages are printed as indicated and that no question is missing
6. Students should answer the questions in English

 FOR EXAMINERS USE ONLY

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| QUESTIONS | MAXIMUM SCORE | CANDIDATE’S SCORE  |
| 1-16 | 80 |  |

1. State one importance of studying chemistry (1 mark)

…………………………………………………………………………………………………………………………………………………………………………………………………….

1. a) Name three illegal drugs (3 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

b) State three ways of preventing drug abuse. (3 marks) ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Complete the following table (8mks)



1. State two laboratory safety rules (2mks)

………………………………………………………………………………………………………………………………………………………………………………………………

1. The apparatus below were used to separate a mixture of liquid A and B.



1. State two properties of liquids that make it possible to separate using such apparatus.

 2 marks)

…………………………………………………………………………………………………………………………………………………………………………………………………..

1. Give the name of the above apparatus. (1 mark)

………………………………………………………………………………………………

1. Describe how you can separate a mixture of sand and common salt (3 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

1. The diagram below shows a Bunsen burner when in use

C

B

A

1. Name the regions labelled B and C. (2 marks)

B………………………………………………………………………………………………

C……………………………….............................................................................................

1. What is the function of the part labeled A? (1 mark)

…………………………………………………………………………………………………

1. State three differences between physical and chemical change. (3 marks)

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| --- | --- |
| **TEMPORARY** | **CHEMICAL** |
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|  |  |
|  |  |

1. i) Differentiate between an acid and base (2 marks) ……………………………………………………………………………………………………………………………………………………………………………………

ii. The following is a list of pH values of some substance: Substance M N V X Z

 pH 10.6 ,7.2 ,13.2 ,5.9, 1.5 respectively Identify:

1. Strong acid (1 mark)

………………………………………………………………………………………………

1. Weak base (1 mark)

………………………………………………………………………………………………

1. The diagram below represents the apparatus used to prepare and collect oxygen.

 **Hydrogen peroxide**



**Solid Q**

 **Solid P**

1. Complete the diagram to show how oxygen gas is collected. (2 marks)
2. Name solid P and Q (2 marks)

P…………………………………………………………………………………….......

Q………………………………………………………………………………………..

1. Write the word equation to show the reaction that produces oxygen gas.(1 mark)
2. State two physical properties of oxygen. (2 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. State three uses of oxygen gas. (3marks)

……………………………………………………………………………………………………………………………………………………………………………………………………..

………………………………………………………………………………………………….

1. A form one student wanted to separate and obtain iodine and sodium chloride (common table salt) from a mixture of the two. He set the experiment set up shown below.



(a). the mixture was heated for some time and left to cool. On cooling, shiny black crystals and white crystals were observed on the surface of the watch glass and in the beaker respectively. Name:

1. Shiny black crystals (1mk)

…………………………………...……………………………………………………………...

1. White crystals (1mk)

…………………………….…………………………………………………………………….

(b). what was the purpose of the cold water in the watch glass? (1mark)

…………………………………………………………………………………………………

(c). what property of iodine makes it be collected on the watch glass as shown? (1mark)

…………………………………………………………………………………………………

(d). Explain why it is possible to separate a mixture of iodine and sodium chloride. (1mark)

…………………………………………………………………………………………………

1. A candle was burnt using the apparatus shown below. The initial volume of measuring cylinder was 90cm3. The apparatus was allowed to cool and the volume of air in the measuring cylinder had dropped to 70cm3.



1. Why was the volume recorded when the air was cooled? (1mk)

………………………………………………………………………………………………

1. What was the purpose of sodium Hydroxide? (1mk)

………………………………………………………………………………………………

1. Use the results given to calculate the percentage of oxygen in air. (2mks)
2. The set up below was used to study some properties of air



State and explain two observation that would be made a t the end of the experiment. (3mks) ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

1. The diagram below represents three methods for collecting gases in the laboratory

a) Name the methods shown in the diagram (3mks)



i………………………………………………………………………………………………

ii…………………………………………………………………………………………………

iii……………………………………………………………………………………………

1. State with reasons the most suitable methods for collecting each of the following gases.
2. Oxygen (1mk)

……………………………………………………………………………………………

1. Hydrogen (1mk)

…………………………………………………………………………………………..

1. a) The diagram below shows spots of pure substance A, B, and C on a chromatography paper. Spot D is that of a mixture after development, A, B and C were found to have moved 8cm, 3cm and 6 cm respectively.

D has separated into two spots which had moved 6cm and 8 cm



(i) On the diagram

I Label the baseline (origin) (1 mark)

II Show the positions of all the spots after development (3 marks)

(ii) Identify the substances present in the mixture D (2 marks)

………………………………………………………………………………………………

(b) Describe how solid ammonium chloride can be separated from a solid mixture of ammonium chloride and anhydrous calcium chloride (2 marks) ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

(c) The table shows liquids that are miscible and those that are immiscible

|  |  |  |
| --- | --- | --- |
| Liquid | L3 | L4 |
| L1 | Miscible | Miscible |
| L2 | Miscible | Immiscible |

Use the information given to answer the questions that follow

1. Name the method that can be used to separate L1 and L3 from a mixture of two

 (1mk)

…………………………………………………………………………………………..

1. Describe how a mixture of L2 and L4 can be separate

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………… ……………………………………………….

1. Complete the word equations for the following reactions; (3mks)

 (a) Sodium carbonate + hydrochloric acid =

 (b) Zinc + sulphuric acid =

 (c) Potassium hydroxide + nitric acid =

1. In an experiment, dry hydrogen chloride gas was passed through heated Zinc turnings as shown in the diagram below. The gas produced was then passed through heated Lead II Oxide.

 Tube L Zinc turnings

 Lead (II) oxide

 tube V

Dilute hydrochloric acid heat

 Flask z

 Concentrated

 sulphuric VI acid

1. What is the function of the water in the flask Z? (1mark)

……………………………………………………………………………………………………………………………………………………………………………………………………

1. Write word equation for the reaction that took place in the combustion tubes.(4marks)

……………………………………………………………………………………………………………………………………………………………………………………………………

1. State three observations made when a piece of potassium is dropped in water (3mks)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..