Name……. class……

Index No……. Sign…….. Date……..

233/3
CHEMISTRY
(PRACTICAL)
Paper 3
July - 2014
2 ¼ Hours

STAREHE GIRLS' CENTRE

JULY - 2014 MOCK EXAM

Kenya Certificate of Secondary Education (K.C.S.E)

233/3
CHEMISTRY
(PRACTICAL)
Paper 3
July 2014
2 ¼ Hours

INSTRUCTIONS TO CANDIDATES

- ***Write your name and index number in the spaces provided above.***
- ***Answer ALL the questions in the spaces provided in the question paper.***
- ***You are not allowed to start working with the apparatus for the first 15 minutes of the 2 ¼ hours allowed for this paper. This time is to enable you to read the question paper and make sure you have all the chemicals and apparatus that you may need.***
- ***All working MUST be clearly shown where necessary.***
- ***Mathematical tables and electronic calculators may be used.***

For Examiner's use only.

Question	Maximum Score	Candidate's Score
1	23	
2	12	
3	5	
TOTAL SCORE	40	

This paper consists of **6** *Printed pages.*
Candidates should check the question paper to ensure that all the
Papers are printed as indicated and no questions are missing.

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1.You are provided with:

- Solution M; Hydrochloric acid
- Solution N, containing 8.8g per litre of sodium hydroxide
- Solid P, 0.5g of an impure carbonate.

You are required to determine the,

(a) Concentration of solution N in moles per litre

(b) Percentage purity of the carbonate, solid P.

PROCEDURE I

Fill the burette with sodium hydroxide, solution N. Pipette 25cm^3 of hydrochloric acid solution M into a conical flask. Add 2-3 drops of methyl orange indicator and titrate (the colour of the indicator changes from pink to orange). Record your results in table 1 below. Repeat the titration two more times and complete the table.

Table 1.

	I	II	III
Final burette reading			
Initial burette reading			
Volume of solution N used (cm^3)			

(4 marks)

(a)Calculate:

(i) average volume of solution N used. (1 mark)

(ii) concentration of N in moles per litre (Na=23, O= 16, H=1) (1 mark)

(iii) concentration of solution M in moles per litre. (3 marks)

PROCEDURE II

Using a measuring cylinder, measure out 100cm^3 of solution M into a 250cm^3 beaker. Add all of solid P into the beaker containing solution M. Swirl the mixture and allow the reaction to proceed for about **4 minutes**. Label the solution obtained here as **Q.** Fill the burette with sodium hydroxide solution N. Pipette 25cm^3 of solution Q into a conical flask. Add 2-3 drops of methyl orange indicator and titrate. Record your results in table 2 below. Repeat the titration two more times and complete the table.

Table 2

	I	II	III
Final burette reading			
Initial burette reading			
Volume of solution N used (cm^3)			

(4 marks)

(b) Calculate:

(i) average volume of solution N used; (1 mark)

(ii) moles of hydrochloric acid in 25cm^3 of solution Q. (2 marks)

(iii) moles of hydrochloric acid in 100cm^3 of Q. (1 mark)

(iv) moles of hydrochloric acid in 100cm^3 of original hydrochloric acid, solution M. (1 mark)

(v) moles of hydrochloric acid that were used up in the reaction with solid P. (1 mark)

(vi) moles of the carbonate that reacted with hydrochloric acid. (2 marks)

(c) Given that the relative formula mass of the carbonate is 106, calculate the;

(i) mass of the carbonate that reacted. (1 mark)

(ii) percentage purity of the carbonate, solid P. (1 mark)

2. You are provided with:

2M sodim hydroxide solution S_1 and a solution of a monobasic acid S_2.

You are required to determine the molarity of S_2.

Procedure.

(a)Place 50cm^3 of the 2M sodium hydroxide into a 200cm^3 plastic beaker insulated with tissue paper. Measure the temperature of this solution and record it in the table below.

(b) To the sodium hydroxide solution in (a) above add 10cm^3 of solution S_2 while stirring and record the maximum temperature obtained after each addition. Record your results in the table below.

Table.

Total volume of S_2 added (cm^3)	Total volume of mixture (cm^3)	Final temperature (°C)
0	50	
10	60	
20	70	
30	80	
40	90	
50	100	
60	110	
70	120	
80	130	

(2 marks)

(i)On the graph paper provided plot a graph of temperature against volume of acid S_2. (3 marks)

(ii) What does the highest temperature on your graph show? (1 mark)

(iii) What volume of S_2 will neutralize $50cm^3$ of 2M sodium hydroxide? (1 mark)

(iv) Calculate the molarity of solution S_2. (2 marks)

(v) Determine the molar heat of neutralization. (Specific heat capacity $=4.2jg^{-1}K^{-1}$, assume density of solution is $1g/cm^3$) (3 marks)

3. You are provided with a sample of solid CB6. Carry out the tests below and record your observations and inferences in the spaces provided.

Place the whole of solid CB6 into a boiling tube and add about $10cm^3$ of distilled water and shake well to dissolve. Use about $1cm^3$ portions of the solution for the tests below.

(i)Using the first portion, add drop wise about $1cm^3$ of sodium hydroxide solution.

Observations	Inferences
1 mark)	(1 mark)

(ii) To the second portion, add 3 drops of barium nitrate solution.

Observations	Inferences
(1 mark)	(1 mark)

(iii) To the third portion, add 3 drops of acidified potassium dichromate (VI) solution.

Observations	Inferences
(½ mark)	(½ mark)

ANSWERS:

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