NAME..... INDEX NO.....

Candidates signature:.....

Date.....

GATUNDU SOUTH SUB COUNTY FORM FOUR 2014 EVALUATION EXAM

233/3
CHEMISTRY
PAPER 3
PRACTICAL
JULY/AUGUST 2014
TIME: 2 ¼ HOURS

KENYA CERTIFICATE OF SECONDARY EDUCATION
CHEMISTRY
PAPER 3
2 ¼ HOURS

INSTRUCTIONS

- Answer all the questions in the spaces provided.
- All working must be clearly shown where necessary

FOR EXAMINERS USE ONLY

Question	Maximum score	Candidate's score
1		
2		
3		
Total score	40	

1. You are provided with:

- Solid A – 6g of an organic acid.
- Solution B – 0.2M sodium hydroxide

You are required to determine:

(i) The solubility of solid A

(ii) The R.M.M. of solid A.

PROCEDURE I

i) Fill the burette with distilled water.

ii) Place solid A in the boiling tube.

iii) Transfer 4cm^3 of distilled water from the burette into the boiling tube containing solid A. Heat the mixture while stirring carefully with thermometer until all the solid dissolves.

iv) Cool the solution by dipping it in the provided beaker containing cold water while stirring with the thermometer. Record the temperature at which crystals start to form in the Table I below.

v) Add a further 1cm^3 of distilled water from the burette to the mixture. Repeat the procedure (iii) and (iv) above and record the crystallization temperature.

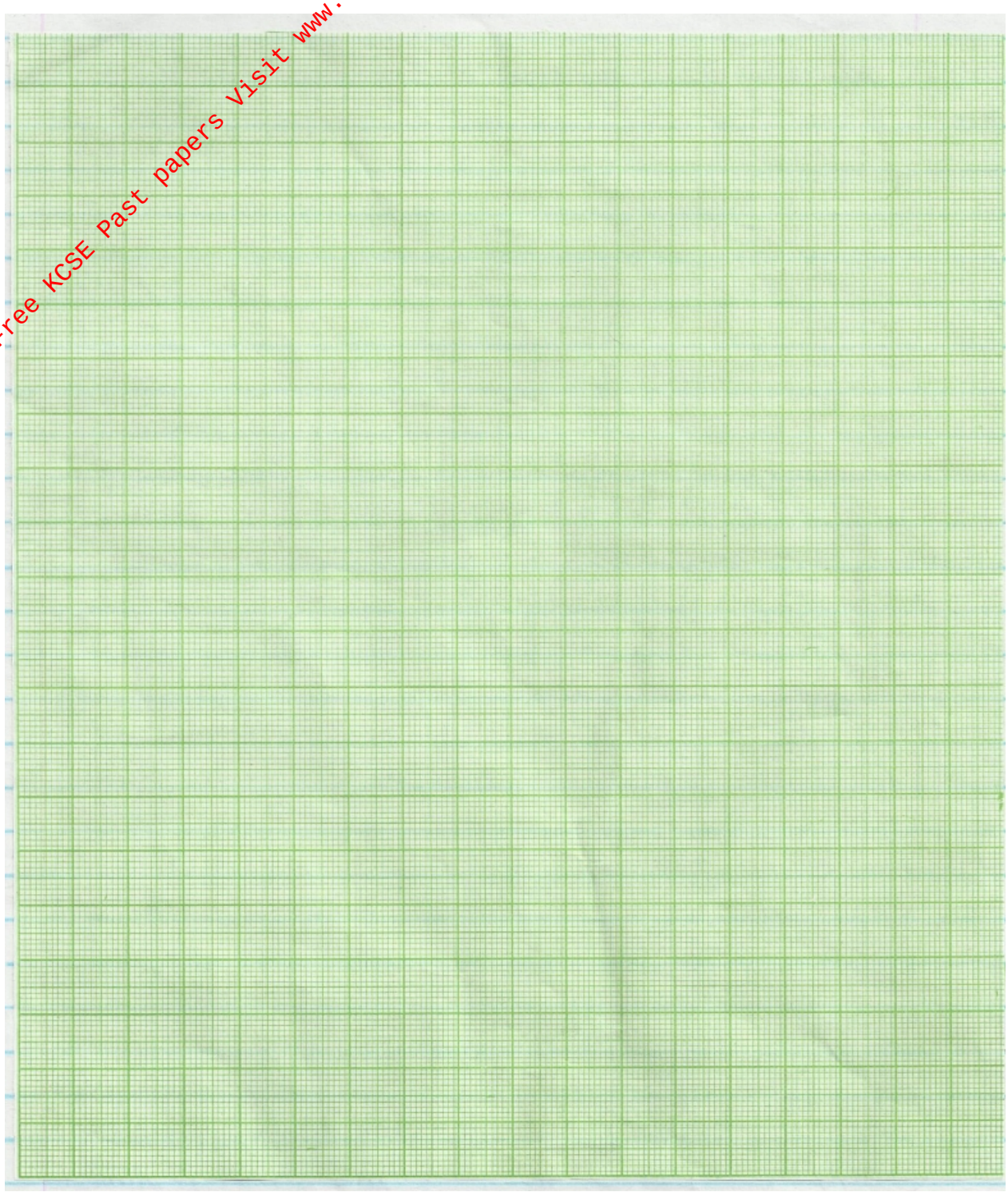
Complete Table I below by adding the volumes of distilled water as indicated.

RETAIN THE CONTENTS OF THE BOILING TUBE FOR USE IN PROCEDURE II

Table I

Volume of distilled water in boiling tube	Crystallization temperature	Solubility of solid A in 100 of water
4 5 6 7 8		

a) On the grid provided, plot a graph of solubility of solid A (y-axis) against crystallization temperature. (3 marks



b) From the graph, determine

(i) The solubility of A at $40^{o}C$ (1 mark)

(ii) The temperature at which 110g of A dissolve in 100g of water. (1 mark)

PROCEDURE II

i) Transfer the contents of the boiling tube in procedure I into a clean 250ml volumetric flask. Add distilled water to the mark. Label the resulting solution A.

ii) Fill the burette with solution A. Pipette $25cm^3$ of solution B into a clean 250ml conical flask. Add 3 drops of phenolphthalein indicator.

iii) Titrate A against B and record your results in table II below.

iv) Repeat the experiment two more times and complete the table II below.

Table II

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

(4 marks)

Calculate:

a) Average volume of A used. (1 mark)

b) (i) The moles of sodium hydroxide solution B used. (1 mark)

(iii) The moles of A used given that the mole ratio of A:B is 1:2 (1 mark)

(iv) The molarity of Acid solution A. (2 marks)

(v) The R.M.M of the acid. (2 marks)

2. You are provided with solid T. Carry out the following tests and write your observations and inferences in the spaces provided.

a) Place all solid T in a boiling tube. Add about 6cm^3 of distilled water to the solid T and shake the mixture well. Retain the mixture for use in the following tests.

Observation	Inference
(1 mark)	(1 mark)

b) Dip a clean glass rod in the mixture obtained above and burn it on a Bunsen burner flame.

Observation	Inference
(1 mark)	(1 mark)

c) Divide the mixture in the boiling tube into 3 portions.

(i) To the 1st portion, add about 3 drops of potassium iodide solution.

Observation	Inference
(1 mark)	(1 mark)

(ii) To the 2nd portion, add about 1cm^3 of barium chloride solution. Retain the resulting mixture for use in (iii) below.

Observation	Inference
(1 mark)	(1 mark)

(iii) To the mixture in (ii) above, add about 4cm^3 of dilute hydrochloric acid.

Observation	Inference
(1 mark)	(1 mark)

(iv) To the 3rd portion, add about 3 drops of acidified potassium dichromate (VI) solution.

Observation	Inference
(1 mark)	(1 mark)

3. You are provided with liquid J. Use it to carry out the tests below.

a) Place half of liquid J on a watch glass and ignite using a burning splint.

Observation	Inference
(1 mark)	(1 mark)

b) Divide the remaining liquid into 4 equal portions

(i) To the 1st portion, add 3 drops of acidified potassium manganate (VII) solution and warm.

Observation	Inference
(1 mark)	(1 mark)

(ii) To the 2nd portion, add about 1cm^3 of bromine water.

Observation	Inference
(1 mark)	(1 mark)

(iii) To the 4th portion, add solid sodium hydrogen carbonate provided.

Observation	Inference
(1 mark)	(1 mark)