Name: ..... **Index No.** .....

School: ..... **Date:** ..... **Candidate's Sign** .....

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233/3
CHEMISTRY
PAPER 3 (PRACTICAL)
FORM 4
MARCH / APRIL 2013
TIME: 2¼ HOURS

ELDORET EAST INTER - SCHOOLS EXAMINATIONS - 2013

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

INSTRUCTIONS TO CANDIDATES

- Write your Name and Index Number in the spaces provided.
- Answer **ALL** 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 read the question paper and ensures that you have all the chemicals and apparatus that you may require.
- All working must be clearly shown where necessary.
- Mathematical tables and electronic calculators may be used.

FOR EXAMINER'S USE ONLY

Questions	Maximum Score	Candidate's Score
1	23	
2	7	
3	8	
Total score	**40**	

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1. You are provided with

- 1.60g of solid P, a dibasic acid
- Aqueous Sodium hydroxide, solution R.
- Acid Q, labeled solution Q.
- 0.2M sodium hydroxide labeled solution D.

You are required to:-

a) Prepare a solution of solid P and use it to determine the concentration of sodium hydroxide, solution R.

b) Use solution D to determine the reaction ratio between sodium hydroxide and acid Q.

PROCEDURE I

a) Place All of solid P in a 250ml volumetric flask. Using a measuring cylinder add about 150cm^3 of distilled water, shake well to dissolve the solid and then add water to make upto the mark. Label this solution P.

b) Place solution P in a clean burette using a pipette and pipette filler, place 25.0cm^3 of solution R in a 250ml conical flask.
Add 2 drops of phenolphlthalein indicator and titrate with solution P. Record your results in table 1. Repeat the titration two more times and complete the table.

Table 1

	I	II	III
Final Burette reading, cm^3			
Initial Burette reading, cm^3			
Volume of solution P used (cm^3)			

(4marks)

Calculate:-

i) Average volume of solution P used. (1mark)

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ii) Concentration in moles per litre of the dibasic acid in solution P (Relative molecular mass of P is 126) (2marks)

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iii) Moles of the dibasic acid used. (1mark)

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iv) Moles of sodium hydroxide in 25.0cm^3 of solution R. (1mark)

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v) Concentration of sodium hydroxide in moles per litre. (1mark)

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PROCEDURE II

Fill a clean burette with solution Q, place 5cm^3 of solution Q into a 100ml beaker. Measure the initial temperature of solution Q in the beaker and record it in table 2.

Using a 10ml / 100ml measuring cylinder measure 25cm^3 of solution D. Add it to solution Q in the beaker and immediately stir the mixture with the thermometer.

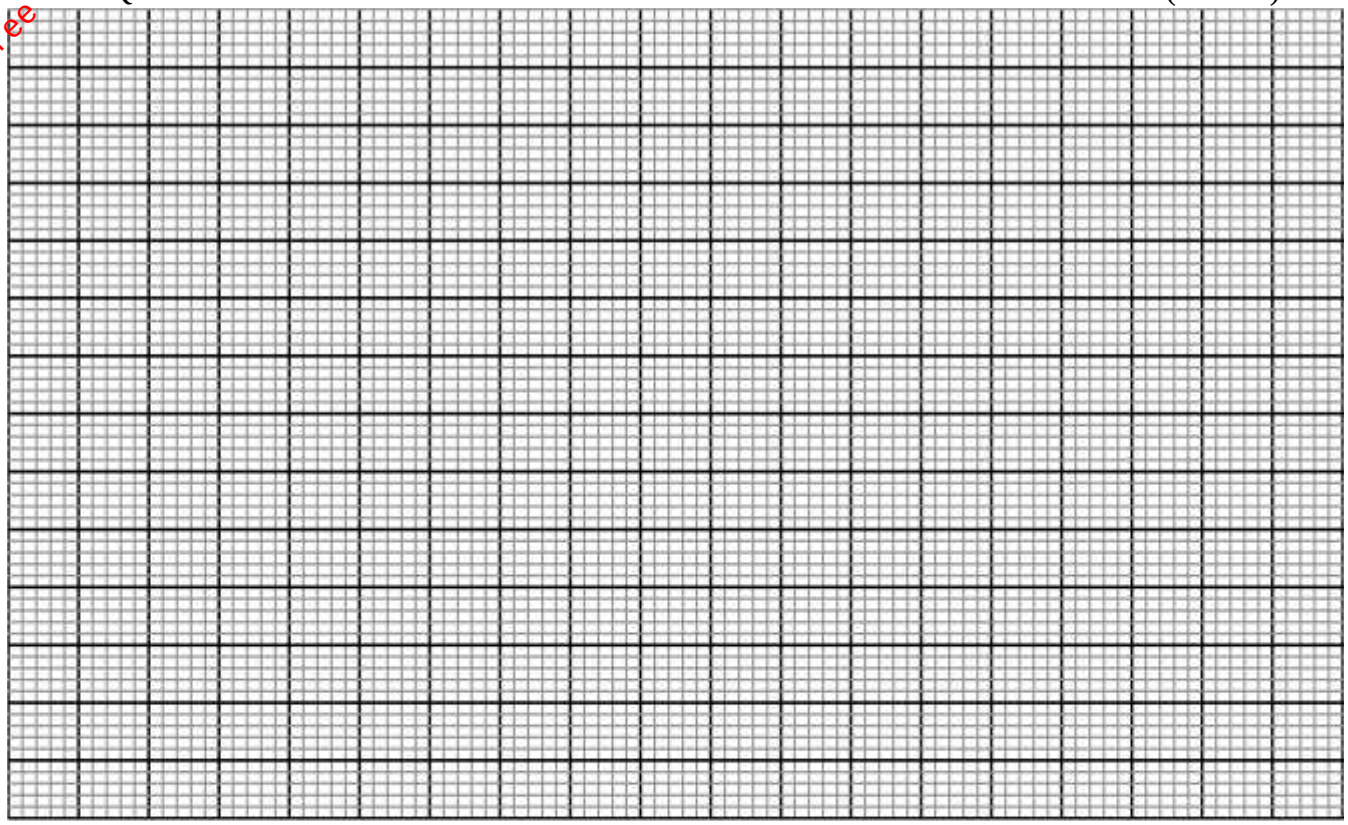
Record the maximum temperature reached in table 2. Repeat the experiment with other sets of volumes of solution Q and D and complete the table.

Table 2

Volume of solution Q(cm^3)	5	9	13	17	21	25
Volume of solution D (cm^3)	25	21	17	13	9	5
Maximum temperature (^{0}C)						
Initial temperature (^{0}C)						
Change in temperature, ΔT						

(6marks)

a) On the grid provided. Plot a graph of ΔT (vertical axis) against the volume of solution Q. (3marks)



b) From the graph determine the volume of solution Q which gave the maximum change in temperature. (1mark)

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c) Determine the volume of solution D that reacted with the volume of solution Q in (b) above. (1mark)

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Calculate:-

i) Ratio between the volumes of solution Q and D that neutralized one another. (1mark)

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ii) Concentration in moles per litre of the acid in solution Q. (Assume that volume ratio is the same as the mole ratio). (1mark)

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2. You are provided with solid H and K.

Carry out the tests below and write your observations and inferences in the spaces provided.

a) Place all of solid H in a boiling tube. Add 20cm^3 of distilled water and shake until all the solid dissolves. Label this solution H.

i) To about 2cm^3 of solution H is a test tube, add 4 drops of 2M sulphuric (VI) acid.

Observations	Inferences
(1mark)	(1mark)

ii) To about 2cm^3 of solution H in a test tube, add 2M sodium hydroxide dropwise until in excess.

Observations	Inferences
(1mark)	(1mark)

iii) Place one half of solid K in a test-tube. Add 2cm^3 of distilled water and shake well. Add 4 drops of this solution to about 2cm^3 of solution H in a test-tube.

Observations	Inferences
(1mark)	(1mark)

iv) To about 2cm^3 of solution H in a test tube, add 2 drops of aqueous potassium iodide.

Observations	Inferences
(½mark)	(½mark)

3. You are provided with solid M. Carry out the tests below and record your observations and inferences.

Place all the solid M provided in a boiling tube and about 10cm^3 of distilled water while shaking. Label it solution M. Divide solution M into four portions.

Observations	Inferences
(½mark)	(1mark)

i) To the first portion, add ammonia solution dropwise till in excess.

Observations	Inferences
(½mark)	(2marks)

ii) To the second portion, add a few drops of barium nitrate solution.

Observations	Inferences
(1mark)	(1½mark)

iii) Warm the third portion and then add a few drops of bromine water.

Observations	Inferences
(1mark)	(½mark)

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