

Name.....

Index No.....

School.....

Candidate's sign.....

Date.....

233/3

CHEMISTRY

PAPER 3

(PRACTICAL)

JULY / AUGUST 2013

Time: 2 ¼ Hours

SUBUKIA DISTRICT JOINT EVALUATION TEST – 2013

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

233/3

CHEMISTRY

PAPER 3

(PRACTICAL)

Time: 2 ¼Hours

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the spaces provided.
2. Sign and write the date of examination in the spaces provided.
3. Answer ALL the questions in the spaces provided in the question paper
4. 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 required.
5. ALL working MUST be clearly shown where necessary
6. Mathematical tables and electronic calculators may be used.

FOR EXAMINER'S USE ONLY

QUESTION	MAXMUM SCORE	CANDIDATE'S SCORE
1	10	
2	13	
3	17	
TOTAL	40	

This paper consists of 8 printed pages. Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

1. You are provided with:

0.4M solution of acid S

Solution P contains 10.0g of sodium hydroxide solution in 250cm³ of solution.

You are required to determine the basicity of acid P.

Procedure

Fill the burette with solution S up to the mark.

Pipette 25.0cm³ of solution P into a clean 250cm³ conical flask. Add 3 drops of phenolphthalein indicator and titrate with solution S till end point. Record your reading in the table below. Repeat the experiment two more times and complete the table

Table 1

	I	II	III
Final burette reading(cm ³)			
Intial burette reading (Cm ³)			
Volume of solution S used (Cm ³)			

(4mks)

(a) Determine the average volume of solution S used (1mk)

.....
.....

(b)Determine the concentration of solution P in moles per litre (Na=23.0, O=16.0 ,H=1.0) (1mk)

.....
.....

(c)Calculate the number of moles of solution P in the 25.0cm³ of the solution (1mk)

.....
.....

(d) Calculate the number of moles of acid S, in the average volume obtained (1mk)

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.....
.....

(e) Determine the basicity of acid S (2mks)

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.....

2. You are provided with:

- Solution Q, A monobasic acid.
- Solution R, 1.0M sodium hydroxide

You are required to determine the heat of reaction per mole of Q using the procedure below;

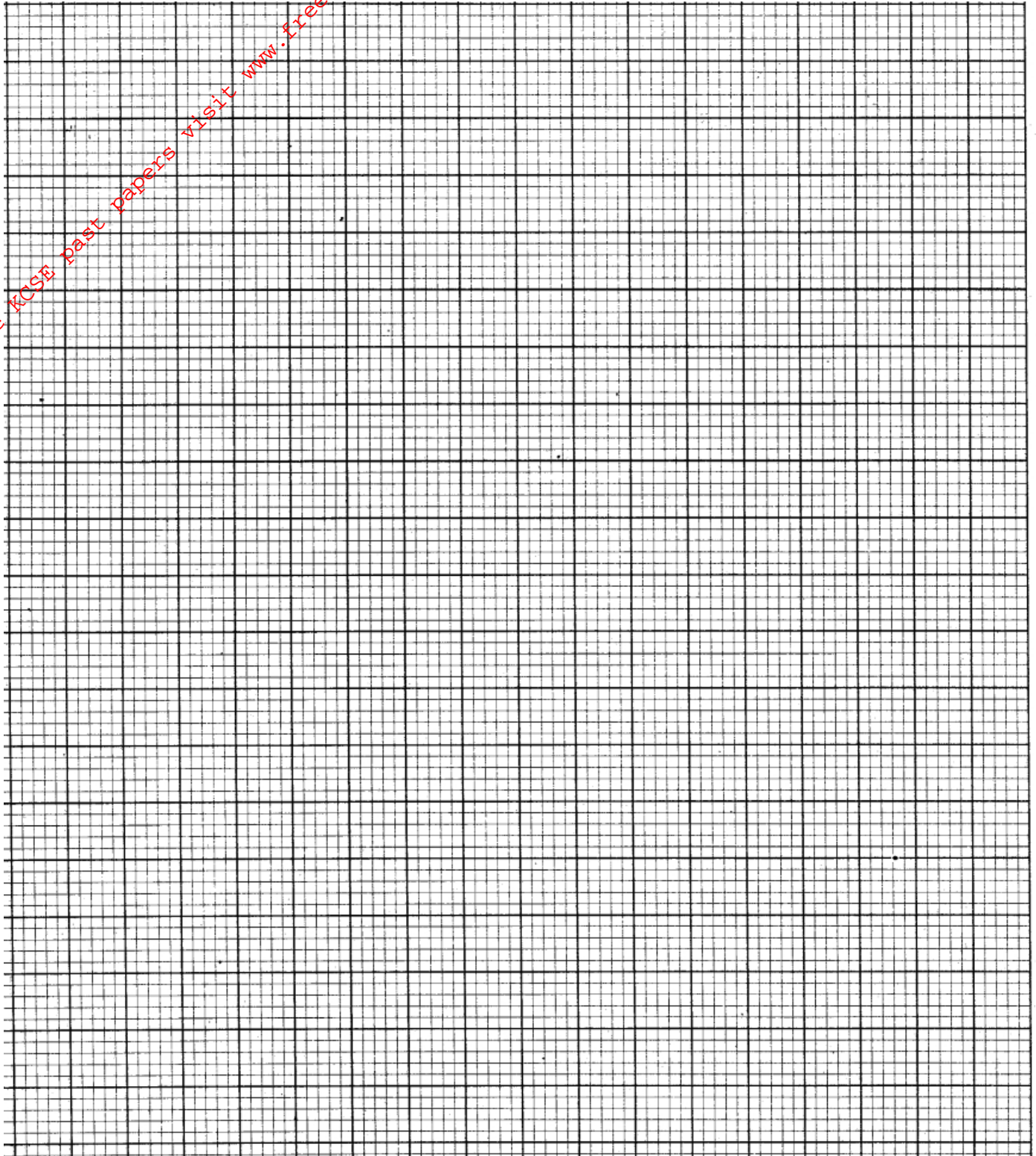
Procedure

- Rinse the burette with solution Q, then fill it with solution Q
- Using a measuring cylinder put 20.0cm³ of solution R into the empty plastic beaker provided.
- Add 4.0 cm³ of solution Q from the burette into solution R in the beaker, stir the mixture with a thermometer and determine the highest temperature attained. Record in the table below.
- Add 4.0 cm³ more of solution Q to the mixture above and determine the highest temperature attained as above.
- Continue adding 4.0cm³ of portions of Q and repeat the procedure as above to complete the table below. (3mk)

Table 2

Volume of solution Q (cm ³)	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0
Highest temperature (°C)								

(a) Plot a graph of highest temperature against volume of Q (3mks)



(b) Determine the volume of solution Q that reacts completely with solution R, using your graph (1mk)

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(c) From your graph determine the initial temperature of solution Q (1mk)

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.....

(d) Determine the temperature change when solution R is completely reacted with solution Q (1Mk)

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.....

(e) Determine the heat evolved when the reaction is complete. (Density of solution = 1g/cm^3 , specific heat capacity = 4.2J/g/K) (2mks)

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.....
.....

(f) Determine the heat of reaction per mole of solution Q used. (2mks)

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.....

3. (a) You are provided with solid H. Carry out the following tests and record your observations and inferences.

(a) Place all solid H in a boiling tube. Add about 10.0cm^3 of distilled water and shake well to dissolve. Label this as solution H. Use it for tests below.

(i) To about 2cm^3 of solution H in a test-tube add sodium hydroxide solution dropwise till in excess

Observations	Inferences
(1mk)	(1mk)

(ii) To about 2cm^3 of H in a test-tube add 3 drops of barium chloride solution.

Observations	Inferences
(1mk)	(1mk)

(iii) To about 2cm^3 of solution in a test-tube add 3 drops of lead (II) nitrate solution.

Observations	Inferences
(1mk)	(1mk)

(iv) To about 2cm^3 of solution H in a test-tube add about 5 drops of aqueous sodium hydroxide solution. Add aluminum foil provided to the mixture and shake. Warm the mixture and test any gases produced with both red and blue litmus papers.

Observations	Inferences
(2mk)	(1mk)

(v) Dip a nichrome wire into the remaining solution H and burn it on a blue flame of Bunsen burner.

Observations	Inferences
(1mk)	(1mk)

3.(b) You are provided with solid T. Carry out the following tests below and record your observations and inferences in the spaces provided.

(i) Place half of solid T on a metallic spatula and burn in non-luminous flame of the Bunsen Burner.

Observations	Inferences
(1mk)	(1mk)

To the remaining solid T add 10 cm³ of distilled water and shake well. Use 2cm³ portions of the mixture for the following reactions.

(ii) To the first portions in a test-tube add 3 drops of bromine water

Observations	Inferences
(1mk)	(1mk)

(iii) To the second portion in a test-tube add 2 drops of acidified potassium manganate(VII) solution and shake well

Observations	Inferences
(1mk)	(1mk)

(iv) To the third portion in a test-tube add a little solid magnesium carbonate

Observations	Inferences
(1mk)	(1mk)
