Name……. **Index No……/…….**

School…… **Date ……..…**

Candidate's Signature……

233/3
CHEMISTRY
PRACTICAL
PAPER 3
JULY / AUGUST 2010
Time: 2 ½ Hours

BORABU – MASABA NORTH DISTRICTS JOINT EVALUATION TEST - 2010
Kenya Certificate of Secondary Education (K.C.S.E)

CHEMISTRY
PRACTICAL
PAPER 3
JULY / AUGUST 2010
Time: 2 ½ 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.
- Mathematical tables and silent electronic calculators may be used
- All workings MUST be clearly shown where necessary.

FOR EXAMINER'S USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
1	22	
2	10	
3	08	
TOTAL SCORE	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;

- A dibasic acid labeled solution P
- Solution R containing 5.56g per litre of potassium carbonate
- Aqueous sodium hydroxide labeled solution T

You are required to determine the:

- Concentration of solution P in moles per litre
- Molar heat of neutralization of solution P with sodium hydroxide labeled solution T

A Procedure

Using a pipette filler, place 25cm^3 of solution P into a 250ml volumetric flask. Add water to make 250cm^3 of solution label this solution Q. Place solution Q in a burette. Clean the pipette and use it to place 25.0cm^3 of solution R into a conical flask. Add 2 drops of methyl orange indicator provided and titrate with solution Q. Record your results in table 1. Repeat the titration two more times and complete the table.

Table 1

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

(4mks)

Calculate the:

i) Average volume of solution Q used (1mk)

……

……

ii) Concentration of potassium carbonate in solution R (K = 39.0, O = 16.0, C = 12.0)(1mk)

……

……

iii) Concentration of dibasic acid in solution Q (2mks)

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……

……

……

iv) Concentration of dibasic acid in solution P (1mk)

……

……

B Clean the burette and fill it with solution T. Clean the pipette and use it to place 25.0cm^3 of solution P into a 100cm^3 beaker. Measure the initial temperature of this solution and record it in table 2.

From the burette, place 5cm^3 of solution T into the beaker containing 25.0cm^3 of solution P, stir the mixture carefully and record the highest temperature of the mixture in table 2. Place another 5cm^3 of solution T into the mixture in the beaker, stir carefully and record the highest temperature of this mixture in table 2. Continue this procedure of placing 5cm^3 portions of solution T and complete table 2

Table 2

Total volume of solution T added (cm^3)	0	5	10	15	20	25	30
Volume of solution P (cm^3)	25	25	25	25	25	25	25
Temperature (^0C)							

(4mks)

i) On the grid provided, draw a graph of temperature (vertical axes) against volume of solution T used. (3mks)

ii) From the graph, determine

I The highest temperature change, ΔT (1mk)

……

……

II The volume of solution T required to react with $25cm^3$ of solution P. (1mk)

……

……

iii) Calculate the

I The number of moles of solution P used (1mk)

II Molar heat of neutralization of P with sodium hydroxide solution labeled T (Assume the specific heat capacity of the solution is $4.2Jg^{-1}K^{-1}$ and density of solution is $1.0g\ cm^{-3}$) (3mks)

2. You are provided with $10cm^3$ of solution H, which contains two cations and anion. Carry out the tests below and record your observations and inferences in the spaces provided.

a) Add $10cm^3$ of 2M sodium hydroxide to all solution H provided. Shake well filter the mixture into a boiling tube. Retain the filtrate.

Observations	Inferences
(1mk)	(2mks)

b) To the filtrate, add 3drops followed by 5 drops of 2M nitric (V) acid. Retain the solution for use in (i) and (ii) below.

Observations	Inferences
(1mk)	

i) To about $2cm^3$ of solution obtained in (b) above, add aqueous ammonia dropwise until in excess

Observations	Inferences
(1mk)	(1mks)

ii) I To about $2cm^3$ of solution obtained in (b) above, add about 4 drops of Barium chloride

Observations	Inferences
(1mk)	(1mks)

II To the mixture in b(ii) I above, add about $2cm^3$ of 2M aqueous hydrochloric acid

Observations	Inferences
(1mk)	(1mks)

3. You are provided with solid J. Carry out the tests below. Record your observations and inferences in the spaces provided.

a) Place a half of solid J in a clean metallic spatula and ignite it on Bunsen burner flame.

Observations	Inferences
(1mk)	(1mks)

b) Put the remaining portion of solid J in a boiling tube and add about $12cm^3$ of distilled water. Shake to dissolve.

i) To about $2cm^3$ of solution J in a test tube add 2 to 3 drops of bromine water.

Observations	Inferences
(1mk)	(1mks)

ii) To about $2cm^3$ of solution J in a test tube, add about $1cm^3$ of acidified potassium dichromate (IV). Warm gently and allow it to stand for a minute.

Observation	Inference
(1mk)	(1mks)

iii) To about $2cm^3$ of solution J in a test tube, add a small amount of solid Sodium hydrogen carbonate.

Observation	Inference
(1mk)	(1mks)

END