KAPSABET HIGH SCHOOL

233/3 (Kenya Certificate of Secondary Education) Paper 3

INTERNAL MOCK EXAM

CHEMISTRY

(PRACTICAL)

Dec. 2020– 2 ¼ Hours

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

Adm No..... **Date**:.....

Signature ..... **Stream**:.....

Instructions to candidates

a) *Write your Name, Index, Admission number and stream in the spaces provided above.*
b) *Sign and write the examination date on the spaces provided above.*
c) *Answer all the questions in the spaces provided.*
d) *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 apparatus and the chemicals you may need.*
e) *All workings **must** be clearly shown where necessary.*
f) *KNEC mathematical tables and non-programmable silent electronic calculators may be used.*
g) ***Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.***
h) ***Candidates must answer the questions in English.***

For Examiners use only

Question	Maximum Score	Candidate's Score
1	23	
2	09	
3	08	
Total Score	**40**	

1. **You are provided with**
   - Aqueous sulphuric acid labelled solution A
   - Solution B containing 8.0g per litre of Sodium Carbonate
   - An aqueous solution of substance C, labelled solution C.

   You are required to determine the:

   - Concentration of solution A
   - Enthalpy of reaction between sulphuric acid and substance C.

   Procedure

   - Using a pipette place 25.0cm^3 of solution A into a 250ml volumetric flask. Add distilled water to make 250cm^3 of solution. Label the solution D. Place solution D in a burette. Clean the pipette and use it to place 25.0cm^3 of solution B into a conical flask. Add 2 drops of methyl orange indicator provided and titrate with solution D. 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 D used (cm^3)			

(4mks)

Calculate the

i. Average volume of solution D used. (1mk)

ii. Concentration of Sodium Carbonate in solution B (Na = 23.0, O =16.0, C = 12.0)

(1mk)

iii. Concentration of sulphuric acid in solution D. (2 mks)

iv. The concentration of sulphuric acid in solution A. (1mk)

B. Label six test tubes 1, 2,3,4,5 and 6. Empty the burette and fill it with solution A. From the burette place 2cm^3 of solution A into test tube number 1. From the same burette place 4cm^3 of solution A in test tube 2. Repeat the procedure for test tubes number 3, 4,5 and 6 as shown in table 2.

Clean the burette and fill it with solution C. From the burette, place 14cm^3 of solution C into a boiling tube. Measure the initial temperature of solution C to the nearest 0.5^{0}C and record it in table 2. Add the contents of test tube number 1 to the boiling tube containing solution C. Stir the mixture with thermometer. Note and record the highest temperature reached in table 2. Repeat the process with the other volumes of solution C given in table 2 and complete the table.

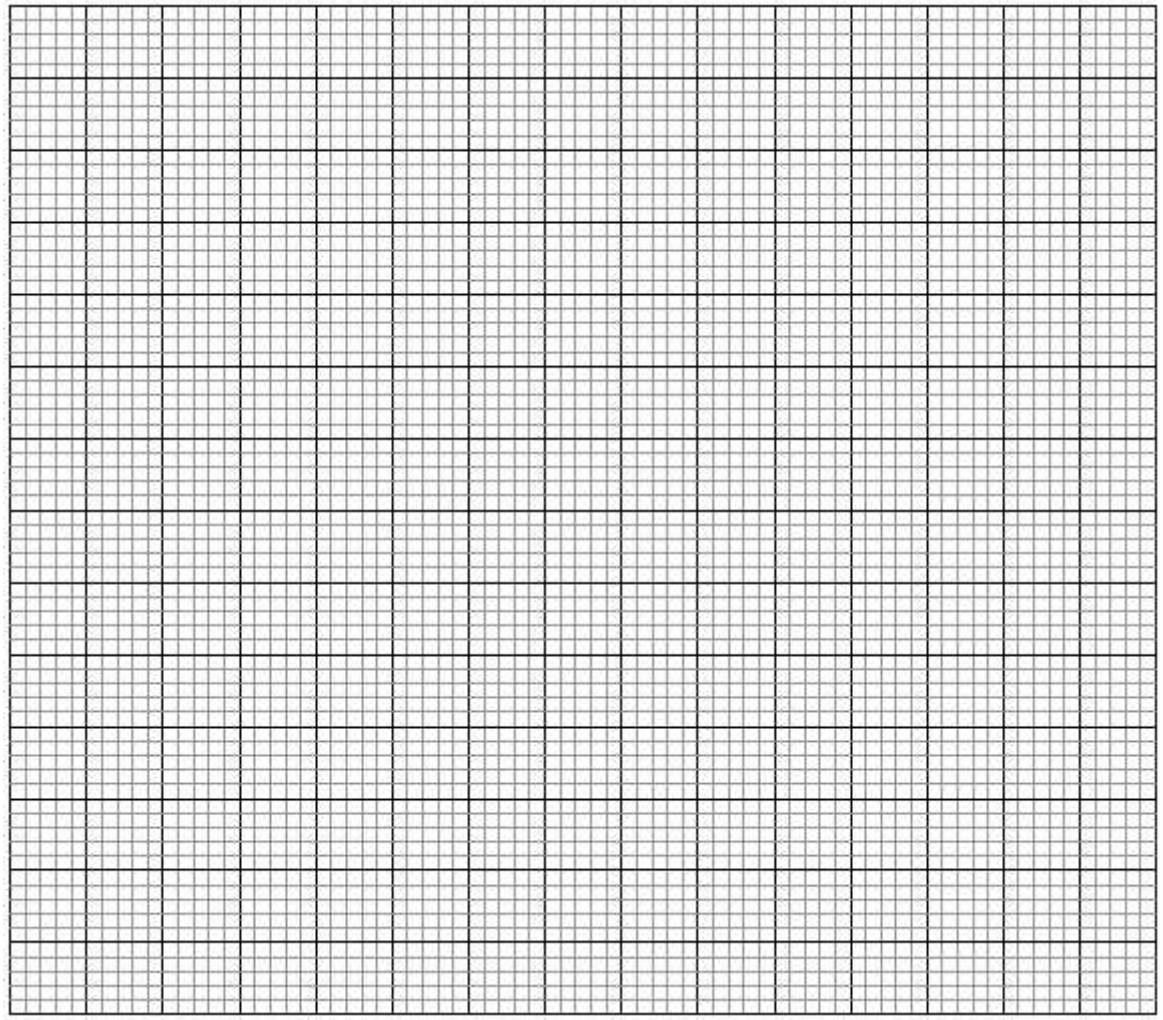
Table 2

Test tube number	1	2	3	4	5	6
Volume of solution A (cm^3)	2	4	6	8	10	12
Volume of solution C (cm^3)	14	12	10	8	6	4
Initial temperature of solution C (^{o}C)						

Highest temperature of mixture (^oC)						
Change in temperature, $\Delta T(^oC)$						

(6mks)

i. On the graph paper provided, draw a graph of ΔT (vertical axis) against volumes of solution A used. (3mks)



ii. From the graph, determine

I. The maximum change in temperature (1mk)

II. The volume of solution A required giving the maximum change in temperature. (1mk)

III. Calculate the

I. Number of moles of sulphuric acid required to give the maximum change in temperature. (1mk)

II. Molar enthalpy of reaction between sulphuric acid and substance C (kilojoules per mole of sulphuric acid). Assume the specific heat capacity of solution is $4.2Jg^{-1}K^{-1}$ and density of solution is $1gcm^{-3}$. (2mks)

2. You are provided with solid E. Carry out the following test and write your observations and inference in the space provided.

a. Place about one –half of solid E in a dry test tube. Heat it strongly and test any gas produced using hydrochloric acid, solution K on a glass rod.

Observations	Inferences

(2mks) (1mk)

b. Place the rest of solid E in a boiling tube. Add about $10cm^3$ of distilled water. Shake well and use $2cm^3$ portions of the mixture for each of the test below.

i. To one portion, add aqueous ammonia drop wise until in excess.

Observations	Inferences

(1mk) (1mk)

ii. To a second portion, add about $1cm^3$ of hydrochloride acid.

Observations	Inferences

(1mks) (1mk)

iii. To the third portion, add three drops of aqueous lead (II) nitrate and heat the mixture to boiling.

Observations	Inferences

(1mks) (1mk)

3. You are provide with liquid F carry out the following tests and record your observation and inferences in the spaces provided.
   a. Place five drops of liquid F on a CLEAN DRY watch glass and ignite it

Observations	Inferences

(1mks) (1mk)

   b. Place $3cm^3$ of liquid F into a test tube followed by $3cm^3$ of distilled water and shake the mixture

Observations	Inferences

(1mks) (1mk)

c. Place about $2cm^3$ of liquid F into a test, add about $1cm^3$ of acidified potassium magnate (VII) and warm the mixture.

Observations	Inferences

(1mks) (1mk)

d). Place about $2cm^3$ of liquid F into a test tube add about $1cm^3$ of acidified potassium dichromate (VI) and warm the mixture.

Observations	Inferences

(1mks) (1mk)