MANGU MOCK TRIAL 3

CHEMISTRY

233/3
PAPER 3 (PRACTICAL)
TIME: 2¼ HOURS

NAME……………………………………………………………………………………

SCHOOL………………………………………………… SIGN………………………

INDEX NO…………………………………………. ADM NO………………………

Kenya Certificate of Secondary Education.

INSTRUCTIONS TO CANDIDATES

➢ Write your **name** and **admission number** in the spaces provided.
➢ **Sign** and write the **date** of examination in the spaces provided.
➢ 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 you need.
➢ All working **must** be clearly shown where necessary.
➢ Mathematical tables and electronic calculators may be used.

FOR EXAMINERS USE ONLY

Question	Maximum Score	Candidate's Score
1	17	
2	14	
3	9	
TOTAL	40	

1. You are provided with:

i) Aqueous Sulphuric (VI) acid labeled solution A.

ii) Solution B containing 10.4g per litre of potassium carbonate.

iii) A clean piece of magnesium ribbon.

iv) Methyl orange indicator.

▪

You are required to determine the:

i) Concentration of solution A

ii) **Rate of reaction between magnesium and Sulphuric (VI) acid – solution A, at different**
   concentration

  Procedure A

i) Using a measuring cylinder, place 25.0cm³ of solution A into a 250ml volumetric flask.

ii) Add distilled water to make 250cm³ of solution. Label this solution C.

iii) Place solution C in a burette.

iv) Using a pipette and pipette filler place 25.0cm³ of solution B into a conical flask.

v) Add 2 drops of methyl orange indicator provided and titrate with solution C.

vi) Record your results in table I below.

▪ Repeat the titration two more times and complete table I.

Table I.

	I	II	III
Final burette reading (cm³)			
Initial burette reading (cm³)			
Volume of solution C used (cm³)			

(3 mrks)

a) Calculate:

i) Average volume of solution C used .   **(1mk)**

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

iii) Concentration of Sulphuric (VI) acid in solution C.   **(1½ mks)**

iv) Concentration of Sulphuric (VI) acid in solution A   **(1½ mks)**

Procedure B

- Label five test tubes 1, 2, 3, 4 and 5.
- Empty the burette wash and rinse. Fill it with solution A.
- From the burette, place $10cm^3$ of solution A into test tube number 1. From the same burette, place $9cm^3$ of solution A into test tube number 2. Repeat the process for test tube numbers 3, 4 and 5 as shown in table II below.
- Using a 10ml measuring cylinder, measure $1cm^3$ of distilled water and add it to test tube number 2. Repeat the process for test-tube numbers 3, 4 and 5 as shown in table II below.
- Cut out five pieces exactly 1cm long of the magnesium ribbon.
- Transfer all the solution in test tube number 1 into a clean 100ml beaker provided. Put one piece of the magnesium ribbon provided. Put one piece of the magnesium ribbon into the beaker and immediately start a stopwatch.
- Swirl the beaker gently to ensure the magnesium is always inside the solution.
- Record in table II below the time taken in seconds for magnesium ribbon to disappear.
- Pour away the final contents of the beaker and rinse it with water.
- Repeat the procedure from (iv) for each of the remaining test tube numbers 2, 3, 4 and 5 and complete the table II

b) **Table II**

Test tube number	1	2	3	4	5
Volume of solution A added cm^3	10	9	8	7	6
Volume of water added cm^3	0	1	2	3	4
Time taken (seconds)					
Rate of reaction $(\frac{1}{time})$					

(4 marks)

i) Plot a graph of volume of solution A added (y –axis) against rate of reaction $\frac{1}{time}$ **(3mks**
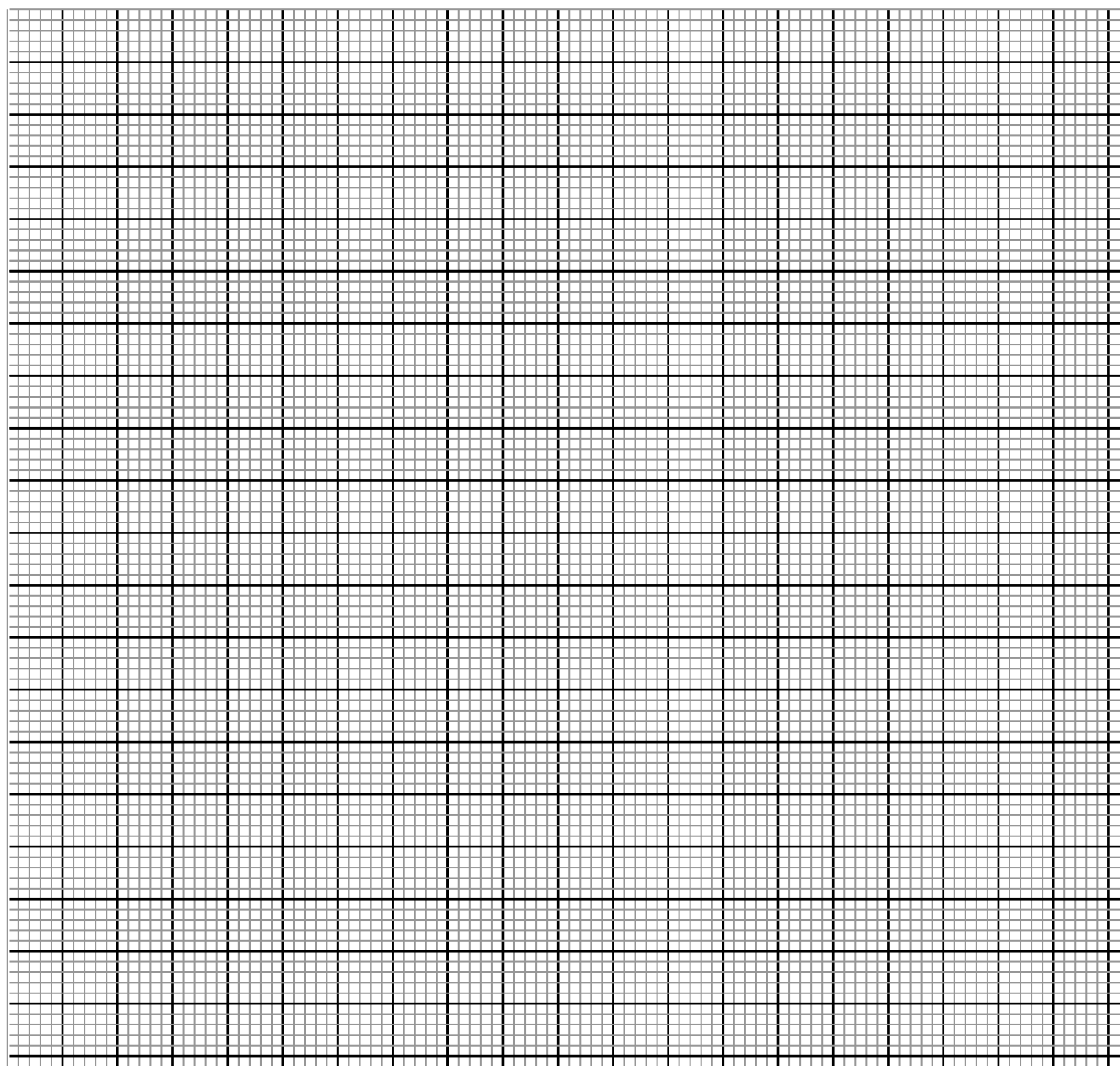
ii) What is the relationship between the concentration of solution A and the rate of reaction? Explain. **(2 marks)**

2. You are provided with mixture N. You are required to:-

i) Carry out tests on mixture N

ii) Record your observations and inferences accordingly.

Procedure

i) Place a spatulaful of mixture N in a test tube.

ii) Add 8cm^3 of distilled water and shake well

iii) Filter and retain the residue

a) Divide the filtrate into five portions.

Observations	Inferences
1mk	1mk

b) Add sodium hydroxide to the first portion drop wise while observing till in excess.

Observations	Inferences
1mk	1mk

c) Add ammonia solution to the second portion of the filtrate drop wise, until in excess.

Observations	Inferences
1mk	1mk

d) Add 1cm^3 dilute hydrochloric acid to the third portion.

Observations	Inferences
1mk	1mk

e) Add a few drops of potassium iodide solution to the fourth portion.

Observations	Inferences
1mk	1mk

f) Add a few drops of lead (ii) nitrate solution to the fifth portion.

Observations	Inferences
1mk	1mk

g) Remove the residue from the filter paper and place it in a test tube, add 5cm^3 of dilute nitric (V) acid.

Observations	Inferences
1mk	**1mk**

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

a) Place about a third of solid K on a metallic spatula and ignite using a non – luminous flame.

Observation	Inference
(1 mark)	**(½ mark)**

b) Place the remaining of solid K into a test tube. Add 10cm^3 of distilled water and shake the mixture well. (Retain the mixture for use in c).

Observation	Inference
(1 mark)	**(½ mark)**

c) i) To about 2cm^3 of the mixture, add 3 drops of universal indicator.

Observation	Inference
(½ mark)	**(½ mark)**

ii) To about 2cm^3 of the mixture, add a small amount of sodium carbonate.

Observation	Inference
(^{1}/$_2$ **mark**)	(^{1}/$_2$ **mark**)

iii) To about 2cm^3 of the mixture, add 2 drops of acidified potassium manganate (VII).

Observation	Inference
(1 mark)	(1 mark)

iv) To about 2cm^3 of mixture, add 2 drops of bromine water.

Observation	Inference
(1mark)	(1 mark)