Name…… **Adm. no …….....**

School: …….. **Class…….**

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

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SERIES 25 EXAMS

233/3
CHEMISTRY
PAPER 3
(PRACTICAL)
TIME: 2 ¼ HOURS

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

INSTRUCTIONS TO CANDIDATES

- Write **your name** and **index number** in the spaces provided above
- **Sign** and **write** the date of examination 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 to **read** the questions paper and **make sure** you have all the chemicals and apparatus that you may need.
- All working **must** be clearly shown where necessary.
- Mathematical tables and electronic calculators may be used.

FOR EXAMINER'S USE ONLY:

Question	Maximum Score	Candidate's Score
1.	20	
2.	8	
3.	12	
TOTAL	**40**	

This paper consists of 4 printed pages . Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing

1. ***You are provided with:***

Metal carbonate, MCO_3, solid **Q**

2M hydrochloric acid, solution **P**

Sodium hydroxide, solution **R** containing 40g per litre of solution.

You are required to determine the relative atomic mass of metal **M**

PROCEDURE

Measure accurately $100cm^3$ of solution **P** into a clean $250cm^3$ conical flask and add all the 4.69g of solid Q, (MCO_3). Shake well and wait for effervescence to stop. Label the resulting solution as S1.

Pipette $25cm^3$ of solution **R** into a conical flask and add 2-3 dropped of phenolphthalein indicator.

Fill a burette with solution S1 and titrate against the solution **R** until the end point.

Record your results in the table below. Repeat the procedure to fill the table

Table 1

	I	II	III
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution S1 used (cm^3)			

Calculate

(i) Average volume of S1 used (1mk)

……

……

(ii) Moles of sodium hydroxide, solution **R** used (2mks)

(Na=23, O=16, H=1)

……

……

(iii) Moles of Hydrochloric acid, solution S1 in average volume used. (2mks)

……

……

(iv) Moles of Hydrochloric acid, solution S1 in $100cm^3$ of solution (2mks)

……

……

(v) Moles of hydrochloric acid in $100cm^3$ of the original solution **P** (2mks)

……

……

(vi) Moles of Hydrochloric acid, solution P, that reacted with solid Q.MCO_3 (2mks)

……

……

(vii) Moles of MCO_3 that reacted (2mks)

……

……

(viii) The relative formula mass of MCO_3 (2mks)

……

……

(ix) The atomic mass of **M** (1mk)

……

2. You are provided with solid **X**. Carry out the tests below and record your observations and inferences in the table below.

(a) Place one spatula endful of solid **X** in a test-tube and add about $10cm^3$ distilled water. Shake well and use for test (i) below.

(i) Test $2cm^3$ of the solution in the test tube with red litmus paper and blue litmus paper.

Observations	**inferences**
1mk	1mk

(ii) To $2cm^3$ of the solution in the test tube, add spatula endful of sodium hydrogen carbonate

Observations	**inferences**
1mk	1mk

(iii) To $2cm^3$ of the solution, add three drops of acidified potassium Manganate VII solution.

Observations	**inferences**
1mk	1mk

(iv) Place about $4cm^3$ of ethanol in a test tube and add 2 drops of concentrated sulphuric acid then add a spatula endful of solid **X**. warm the mixture carefully. Shake well and pour the mixture into $20cm^3$ of water in beaker.

Observations	**inferences**
1mk	1mk

3. You are provided with solid **N**. Carry out the tests and record the observations and inferences in the spaces provided

(a) Dissolve one spatula endful of solid **N** in about $10cm^3$ of distilled water. Divide the solution into five portions

Observations	**inferences**
1mk	1mk

(b) To the 1st portion add aqueous NaOH solution dropwise until in excess

Observations	**inferences**
1mk	1mk

(c) To the 2nd portion add dilute ammonia solution dropwise until in excess

Observations	**inferences**
1mk	1mk

(d) To the 3rd portion add three drops of dilute Sulphuric (VI) acid

Observations	**inferences**
1mk	1mk

(e)To 4th portion add 3 drops of Lead (II) nitrate solution.

Observations	**inferences**
1mk	1mk

(f) To 5th portion add 3 drops of Lead (II) nitrate solution and warm the mixture gently

Observations	inferences
1mk	1mk