NAME: …… IDM. NO.: …….....

SCHOOL …… DATE: …….....

CANDIDATE'S SIGN……..……

233/3
CHEMISTRY
PAPER 3
PRACTICAL

INSTRUCTIONS TO THE CANDIDATES

- *Write your **name school** and **index number in the spaces provided***
- ***Sign** and write the **date** of examination in the spaces provided*
- *Answer **all** the questions in the spaces provided.*
- *You are not allowed to start working with apparatus for the first 15minutes of the 2 ¼ hrs allowed for this paper. This time is enable you to read the question paper and make sure you have all the chemicals and apparatus that you may need*
- *Mathematical tables and electronic calculators may be used.*
- *All working **MUST** be clearly shown where necessary.*
- *Mathematical tables and electronic calculator may be used.*

FOR EXAMINERS USE ONLY

QUESTION	MAX. SCORE	CANDIDATE'S SCORE
1	20	
2	14	
	06	
Total Score	**40**	

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

1. You are provided with:

- Solid A : 0.5g of metal carbonate M_2CO_3
- Solution B: 0.2M sulphuric (vi) acid solution
- Solution C: sodium hydroxide solution

You are required to determine:

- ✓ The relative formula mass of M_2CO_3
- ✓ Relative atomic mass of M

PROCEDURE I

Fill the burette with solution B. Pipette 25cm^3 of solution C and transfer into a conical flask. Add two drops of phenolphthalein indicator. Titrate against solution B from the burette. Repeat two more times and record your results in table 1.

Table 1

Titre	i	ii	iii
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution B used (cm^3)			

(4mks)

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

(b) Calculate the moles of sulphuric (vi) acid that reacted. (1mk)

(c) Calculate the concentration of sodium hydroxide solution **C**. (3mks)

PROCEDURE II

Using a 100ml measuring cylinder, measure 100cm^3 of solution B and transfer into a clean conical flask. Add the whole of solid A to the solution B in the conical flask. Shake to dissolve solid A until no more effervescence occurs. Label the resultant solution as D.

Pipette 25cm^3 of solution C and transfer into a conical flask and add two drops of phenolphthalein indicator. Fill the burette with solution D. titrate solution C against solution D from the burette. Repeat two more times and record your results in table II.

Table II

Titre	i	ii	iii
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution D used (cm^3)			

(4mks)

(a) **Calculate:**

(i) The average volume of solution **D** used. (1mk)

(ii) The moles of solution **D** in d(i) above. (2mks)

(iii) The moles of H_2SO_4 in 100cm^3 of solution **D**. (2mks)

(iv) The moles of in H_2SO_4 100cm^3 of solution **B**. (1mk)

(v) The number of moles of the acid (**solution B**) that reacted with the carbonate. (1mk)

(vi) The moles of carbonate in 0.5g of the carbonate. (2mks)

(e) **Calculate;**

(i) The relative formula mass of the carbonate. (2mks)

(ii) The relative atomic mass of **M.** (1mk)

2. You are provided with solid **Q**. carry out the tests below. You should identify any gases evolved. Record your observations and inferences in the table below.

(a) Place half of solid **Q** in a test tube and heat strongly.

observation	inference
(2mks)	(1mk)

(b) Place the remaining solid **Q** in a test tube and add $3cm^3$ of distilled water. Divide the resultant mixture into two portions

observation	inference
(1mk)	(½ mk)

(c) To the first portion add aqueous ammonia drop wise till in excess.

observation	inference
(1mk)	(1mk)

(d) To the second portion add barium nitrate solution followed by dilute nitric acid

observation	inference
(2mks)	(1mk)

1. You are provided with solid P. carry out the tests below and record your observations and inferences in the table below.

a) Place half of solid P in a clean spatula and ignite.

observation	inference
($1^1/_2$mks)	($^1/_2$mk)

b) Transfer the remaining solid P into a test tube and add about 4 cm^3 of distilled water and shake. Divide the resultant mixture into two portions.

i. To the first portion add two drops of acidified potassium manganate (vii)

observation	inference
(1mk)	($^1/_2$mk)

ii. To the second portion add two drops of acidified potassium dichromate (vi)

observation	inference
(1mk)	($^1/_2$mk)