NAME:	ADM NO
233/3	DATE:
CHEMISTRY	
PAPER 3 FORM 3	
(PRACTICAL)	
2 1/4 HRS	

FORM THREE CHEMISTRY PAPER 3

INSTRUCTIONS TO CANDIDATES

- a) Answer all the questions in the spaces provided in the question paper.
- b) You are NOT allowed to start working with the apparatus for the first 15 minutes of the 2 \(^1\)4 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.
- c) All working must be clearly shown.

FOR EXAMINER'S USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1	16	
2	14	
3	10	
TOTAL SCORE	40	

- 1. You are provided with:
 - 0.2 M Sodium Hydroxide solution
 - X M hydrochloric acid solution X
 - Y M Na₂CO₃ solution Y

You are required to standardize hydrochloric acid and hence determine the concentration of sodium carbonate.

PROCEDURE I

Using a pipette transfer 25cm³ of 0.2M Sodium hydroxide into a conical flask. Add 2-3 drops of phenolphthalein indicator and then titrate with hydrochloric acid provided in a beaker from a burette. Shake the conical flask after each addition and note the volume required to neutralize the sodium hydroxide solution. Record your results in the table below.

Titre I II III

Final burette reading (cm³)

Initial burette reading (cm³)

Volume of X used (cm³)

a) What is the average volume of solution X used? (1 mk)

b) Calculate the number of moles of solution X required to completely neutralize 25cm³ of sodium hydroxide solution. (2 mks)

c) What is the morality of the hydrochloric acid, solution X? (2 mks)

PROCEDURE II

Rinse the pipette thoroughly then pipette 25cm³ of sodium carbonate into a conical flask. Add 2-3 drops of phenolphthalein indicator. Refill the burette with hydrochloric acid and use it to titrate the contents of the conical flask. Shake the flask after each addition of the acid and note the volume of the acid required to neutralize 25cm³ of the sodium carbonate. Record your results in the table below.

(3 mks)

(3 mks)

Titre	Ι	II	III
Final burette reading (cm ³)			
Initial burette reading (cm ³)			
Volume of X used (cm ³)			

d) What is the average volume of hydrochloric acid used in the second procedure? (1 mk)

e) Calculate the number of moles of sodium carbonate in 25cm³ of solution.		(2 mks)	
f) Calculate the concentration of so	dium carbonat	e in moles per litre.	(2 mks)
2. You are provided with solid A. Cayour observations and inferences. a) Heat gently a spatula endful of so		es below. Identify any gas or gases per test tube. Test the gas with red and	
Observations	ma 11 m a ary	Inferences	orac minus paper.
b) Place a spatula endful of solid ADivide the filtrate into two portio(i) To the first portion add 3 drop	ns. Retain the		(2 mk) ilter off the residue.
Observations		Inferences	
	(1 mk)		(1 mk)
(::) T- 4 1 4: 11 2 1	CI 1 ((1)	
(ii) To the second portion add 3 d	rops of Lead (
Observations		Inferences	
c) To the residue obtained in (b) abo	(1 mk) ove add 5cm ³ o	of dilute nitric acid. Divide the solu	(1 mk) tion into two portions.
Observations		Inferences	1
	(1 mk)		(1 mk)

(i) To the first portion add 3 drops of	of Ammonia so	olution and then excess.	
Observations		Inferences	
	(1 mk)	(1 m	ık)
(ii) To the second portion add 3 drop	na of lood (ii) r	sitrata calutian	
Observations	os of fead (II) I	Inferences	
Observations		Interences	
	(1 mk)	(1 m	ık)
the spaces provided.	•	ts below and record your observations and in	nferences in
a) i. Place a half spatula of solid M	in a non-lumi	nous flame of a Bunsen burner.	
Observations		Inferences	
	(1 mk)	(1 m	ık)
-	_	nd add 8cm ³ of water. Divide the solution in	to 4 portion
(i) Place the remaining solid M i	ın a boılıng tub		
Observations		Inferences	
	(1/2 mk)	(1/2	mk)
ii. To the first portion, add 3 dro	ons of acidified	d notassium manganate(vii)	
Observations	ops of actualities	Inferences	
00041, 11110			
	(1 mk)	(1 m	ok)
	(1 IIIK)	(1 11)	ik)
iii. To the second portion, add 3	drops of acidi	fied potassium dichromate (vi) and warm.	
Observations		Inferences	
	(1 mk)	(1 m	ık)
	` '		,
iv. To the third portion, add a lit	tle sodium hyd	drogen carbonate.	
Observations		Inferences	
	(1/2 mk)	(1/2)	mk)

v. To the fourth portion, add 3 drops of universal indicator and determine the PH of the solution.

Observations		Inferences	
	(1 1)		(1 1)
	(1 mk)		(1 mk)