Name _____ ADM. No. _____

Date _____

FORM 3
END OF YEAR 2017 EXAMINATON
CHEMISTRY PRACTICAL 233/3
TIME: 2 ¼ HOURS

INSTRUCTIONS TO CANDIDATES

Answer ALL questions in the spaces provided.

Mathematical tables and electronic calculators may be used

All working MUST be clearly shown where necessary.

FOR EXAMINER'SUSE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1	16	
2	12	
3	12	

This paper consists of 5 printed pages

1. You are provided with the following reagents:
   - Solution G which contains 10.6g of metal carbonate, R_2CO_3 in $1000cm^3$ of solution.
   - Solution H which is 0.25M hydrochloric acid.

You are required to determine the relative formula mass of R.

Procedure

Pipette $25cm^3$ of solution G into a conical flask. Add few drops of methyl orange indicator. Fill the burette with solution H and titrate solution G against solution H until the colour of G turns permanetely pink. Record your initial and final burette reading in the table below. Repeat the procedure for the second and third experiment. (4 marks)

	1	2	3
Final burette reading (cm^3)			
Initial burette reading (cm^3)			
Volume of solution T used (cm^3)			

(a) Calculate the average volume of solution H used. (1 mark)

(b) Find the number of moles of solution H that reacted with G. (2 marks)

(c) Find the number of moles of solution G that reacted (2 marks)

(d) Determine the concentration of solution G in:-
(i) Moles per litre. (2 marks)

(ii) Grams per litre (2marks)

(e) Find the relative atomic mass of R.
(C = 12.0, O = 16.0) (3marks)

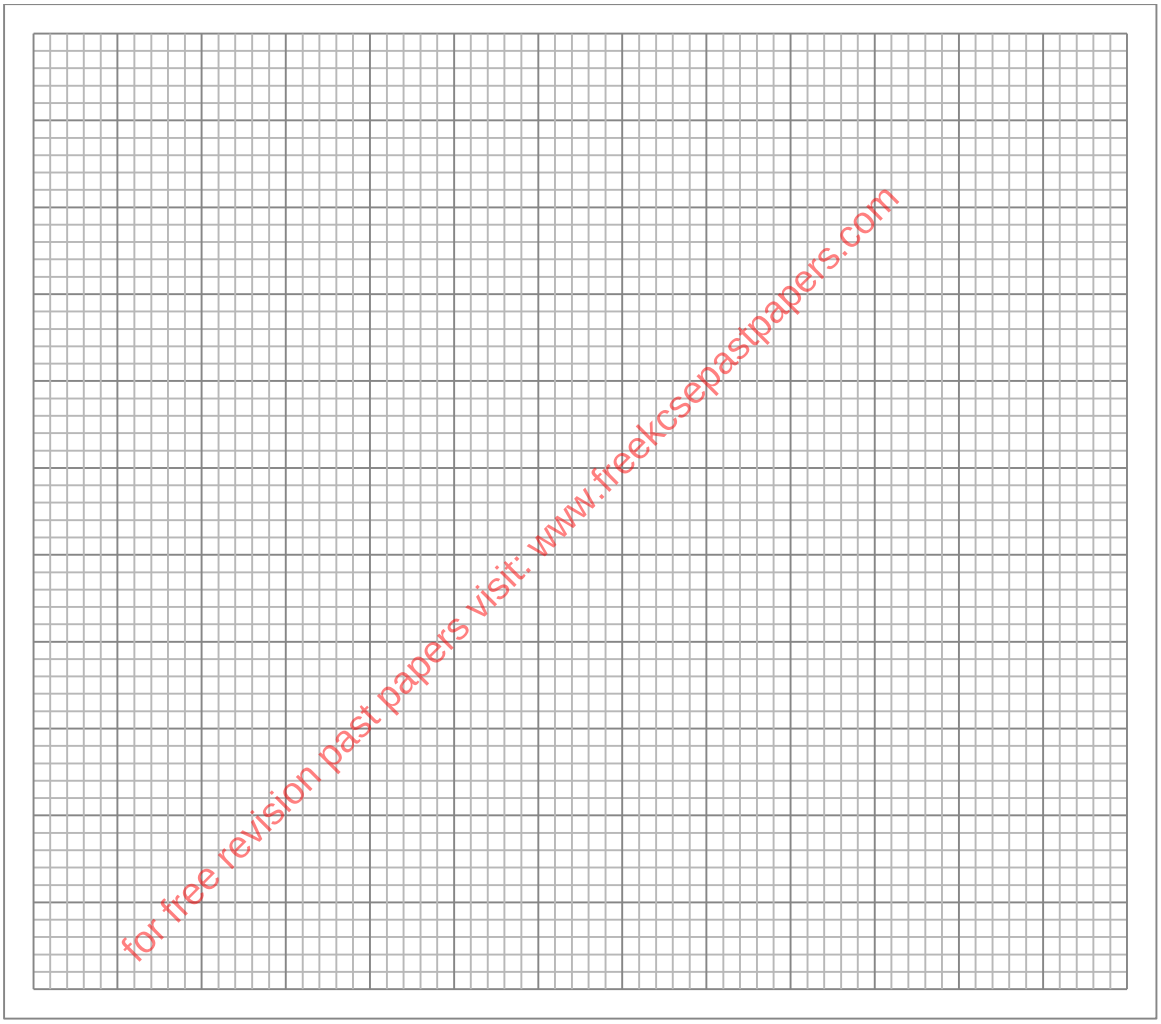
2. You are provided with liquid X, thermometer and 100cm^3 glass beaker. You are required to determine boiling point of liquid X

Procedure:

- Measure about 50cm^3 of liquid X into a 100cm^3 glass beaker. Determine and record its steady temperature…… ^{0}c (1mark)
- Heat liquid X with a Bunsen burner flame and record its temperature after every 20 seconds for 200 seconds (4marks)

Time (seconds)	20	40	60	80	100	120	140	160	180	200
Temperature(^{o}C)										

(a) Plot a graph of temperature (y-axis) against time (x-axis) (5marks)



(b) From the graph determine the boiling point of liquid X ……..……^{0}C (1mark)

(c) At what time was the temperature 40^{0}c …….. (1mark)

3. You are provided with solid A and B, liquids C and D, solution E. Carry out the tests below and record your observation and inferences in the space provided. (12marks)

Procedure	**Observation**	**Inferences**
(a) Add about $4cm^3$ of distilled water to solid A that is provided in the test (i) Add few drops of barium nitrate and keep the solution for step (ii)		
(ii) Add few drops of dilute nitric acid to the solution form step (i)		
(b) Heat strongly half spatula end full of solid B in a non-luminous flame and allow to cool.		
(c) Place a half spatula end full of anhydrous copper (II) sulphate on a watch glass and add few drops of liquid C.		
(d) Divide liquid D into two potions (i) To the first portion, add few drops of acidified potassium manganate (VII) and warm		
(ii) To the second portion add few drops of bromine water		