Name...... Index No...... Adm No.....

Candidate's Signature......Date.....

233/3 CHEMISTRY Paper 3 (PRACTICAL) July 2016 2¹/4 hours

KAMDARA JET - 2016

Instructions to candidates

- (a) Write your name and index number and school in the spaces provided.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) Answer ALL the questions in the spaces provided in the question paper.
- (d) You are not allowed to start working with apparatus for the first 15 minutes of the 2¹/₄ hours allowed for this paper. This is to enable you to read the question paper and make sure you have all the chemicals and apparatus that you may need.
- (e) All working MUST be clearly shown where necessary.
- (f) Mathematical tables and electronic calculators may be used.
- (g) This paper consists of 6 printed pages.
- (h) Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.
- (i) Candidates should answer all the questions in English.

For Examiners use only

~	Question	Maximum	Candidate's
م ² ر		Score	score
fortrec	1	22	
	2	13	
	3	5	
	Total Score	40	

1. You are provided with:

- Solid P
- 2.0M hydrochloric acid, solution Q •
- 0.1M sodium hydroxide, solution R

You are required to determine the enthalpy change ΔH , for the reaction between solid P and one mole of hydrochloric acid.

Procedure I

Transfer 20.0cm³ of 2.0M hydrochloric acid, solution Q in a 100ml beaker using a burette. Measure the temperature of the solution after every half-minute and record the values in Table 1. At exactly $2^{1/2}$ minutes, add all of solid P to the acid carefully. Stir the mixture gently with the thermometer. Measure the temperature of the mixture after every half-minute and record the values in Table 1. (Retain the mixture for use in procedure II)

Table 1					-	ć	orcalli)			
Time(min)	0	1/2	1	11/2	2	21/201	3	31/2	4	41/2	5
Temperature (°C)					astp	Х					
					SOT					(5 n	nks)



- (ii) Using the graph, determine the change in temperature ΔT . (1 mk)
- (iii) Calculate the heat change for the reaction (Assume that the specific heat capacity of the mixture is $4.2 \text{ Jg}^{-1}\text{K}^{-1}$ and the density of the mixture is 1g/cm^3). (2 mks)

Procedure II

Rinse the burette thoroughly and fill it with sodium hydroxide. Transfer all the contents of the 100ml. beaker in procedure I into a 250ml. volumetric flask. Add distilled water to make up to the mark. Label this as solution **N**. Using a **pipette filler**, place 25.0cm³ of solution **N** into a 250ml. conical flask. Add **two** or **three** drops of phenolphthalein indicator and titrate against solution **R**. Record your results in table 2. Repeat titration two more times and complete Table 2.

Table 2

X	رچې I	II	III
C			
Final burette reading(cm ³)			
ww			
Initial burette reading(cm ³)			
15 North Contraction of the contract of the co			
Volume of solution R used (cm ³)			
St. P			
Por			(3 mks

Calculate the:

(i) average volume of sodium hydroxide solution R.

(1 mk)

(ii) the number of moles of :

×0'

- I Sodium hydroxide solution R. (1 mk)
- II hydrochloric acid in 25cm^3 of solution N. (1 mk)

II	I hydrochloric acid in 250 cm^3 the of solution N	(1 mk)
IV	hydrochloric acid in 20.0 cm ³ of solution Q	(1 mk)
V	hydrochloric acid that reacted with solid P	(1 mk)
(c)	Calculate the enthalpy of reaction between solid P and one mole of hydr	လ ochloric acid.
(Show the sign of Δ H).	(2 mks)
2	You are provided with solid E . Carryout the following tests and write and inferences in the spaces provided.	your observations
	 a) Place all of solid E into a boiling tube. Add about 12cm³ of distille thoroughly. Filter the mixture and place the filtrate into another boresidue using pieces of filter paper. Retain the filtrate for use in 2(b) below. (i) Transfer half of the dry residue into a dry test tube. Heat the residue and provide an an	d water and shake biling tube. Dry the ue strongly and test
	Observations	Inferences

(ii) Place the other half of the residue in a dry test-tube. Add 4cm³ of 2M nitric acid.
 Retain the mixture for test (iii) and (iv) below .

(1 mk)

(2 mks)

Observations	Inferences
(1 mk)	(1 mk)



- 3. You are provided with **solid F**. Carry out the tests below and record your observations and inferences in the spaces provided.
 - (a)(i) Using a metallic spatula, heat half of **solid F** in a non-luminous Bunsen burner flame for some time then remove when it ignites.

Observations	Inferences
(1mk)	(1mk)
 (b) Put a half spatula endful of solid F into water and shake vigorously. Divide the resulting solution into two po 	a boiling tube. Add about 10cm ³ of distilled rtions.
(i) To the first portion, dip a piece of univ	versal indicator paper and determine its pH
Observations	Inferences
	72050
(¹ / ₂ mk)	(¹ /2 mk)
 (ii) To the second portion, add two drops of solution and shake vigorously. Observations 	of acidified potassium manganate (VII)
(1 mk)	(1 mk)
tor thee past papers visit.	