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NAME _____ CLASS _____

ALLIANCE HIGH SCHOOL Adm no.

TRIAL EXAMINATION

CHEMISTRY

PAPER 3

PRACTICAL

2.25 HOURS

INSTRUCTIONS

- Write your name and class in the spaces provided above.
- Answer all questions in the spaces provided.
- You are not required to start working with the apparatus for the first 15 minutes.
- Mathematics tables and calculators may be used.
- All working must be clearly shown.

FOR EXAMINER'S USE

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1	12	
2	16	
3	12	
TOTAL	40	

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1. You are provided with :

- Acid solution of H_nX containing 0.4 moles in $1dm^3$, labeled solution C.
- Sodium hydroxide, solution D containing 8g/l.
- Phenolphthalein indicator.

You are required to determine the basicity of acid C.

Procedure

Fill the burette with acid, H_nX solution C. Pipette $25cm^3$ of sodium hydroxide, solution D and transfer it into a clean dry conical flask. Add 3 drops of phenolphthalein indicator. Titrate using the acid and record your results in the table below. Repeat the titration to obtain three consistent titres. (4 marks)

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

(a) Determine the average volume of acid C used. (1 mark)

(b) Calculate the concentration of sodium hydroxide solution D in moles per litre

(Na = 23, O = 16, H = 1) (2 marks)

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(c) Calculate the moles of sodium hydroxide used. (2 marks)

(d) Calculate the moles of acid, H_nX used. (1 mark)

(e) Determine the basicity of acid H_nX. (1 mark)

(f) Write a balanced chemical equation for the reaction. (1 mark)

2 .You are provided with 70 cm^3 of 0.1M sodium hydroxide and 70 cm^3 HCl (solution A). You are required to determine the molar heat of neutralization of HCl and NaOH solutions

Procedure

Take 25cm^3 of 0.1M sodium hydroxide solution and put in 100cm^3 plastic beaker measure its initial temperature and record it. Measure the initial temperature of the HCl (solution A) before

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before the mixing and record it. Add 5.0cm^3 portions of hydrochloric acid and stir thoroughly. Take the temperature of the solution after every addition and record it in the table below

Initial temperature of NaOH 0.5mks

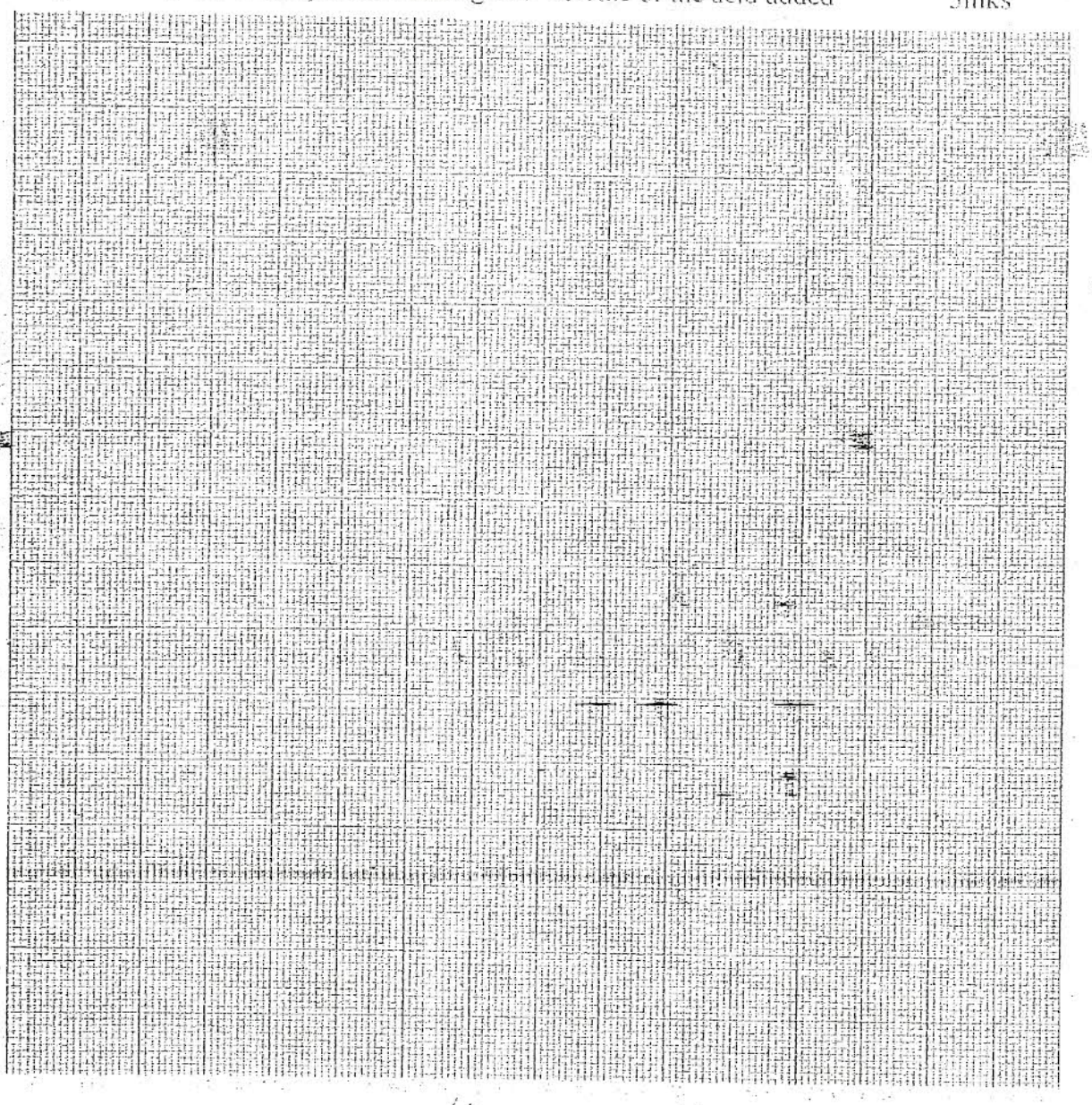
Initial temperature of HCl 0.5mks

Initial average temperature of NaOH and HCl 1mk

Fill in the table below 3mks

Volume of HCl(cm3)	5	10	15	20	25	30	35	40
Temperature (^oC)								

a) Plot a graph of temperature against volume of the acid added 3mks



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b) Use the graph to determine the concentration in moles per litre of the hydrochloric acid 3mks

c) Calculate the molar enthalpy of neutralization of the alkali with hydrochloric acid (specific heat capacity of the mixture is 4.2kJ/kg/k and density of the solution is 1.0 g/cm^3) 3mks

d) The heat obtained in this experiment is slightly lower than the theoretical value, state any two sources of error in this experiment that would have caused that 2mks

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3. You are provided with solid E.

Carry out the tests below to identify the ions present in substance E. Fill your observations and inferences in the table below.

Experiment	observations	Inferences
i) Dissolve a small amount of solid D in distilled water and stir. Divide the solutions into 5 portions	1mk	1mk
ii)To the first portion add 3 drops of 2M barium nitrate solution	1mk	1mk
Iii) To the 2nd portion add 3 drops of 2M lead (II) nitrate	1mk	1mk
iv) to the 3rd portion add 2M sodium hydroxide solution dropwise until excess	1mk	1mk

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v) To the 4th portion add 2M aqueous ammonia solution drop wise till excess	1mk	1mk
vi) to the 5th portion add 2M HCl	1mk	1mk

Mr. Salano

Chemistry dept