SUPAJET

JOINT ASSESSMENT EXAMINATION
July/August 2013
CHEMISTRY DEPARTMENT

Name …….. Class ……. Class No. ……

233/3
CHEMISTRY
PAPER 3
PRACTICAL
TIME – $2^1/_4$HRS.

Index Number: ……

INSTRUCTIONS.

Answer ALL the questions in the spaces provided in the question paper.
You are NOT allowed to start working with the apparatus for the first 15 minutes of the 2¼ 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.
Electronic calculators may be used
All working must be clearly shown shown where necessary.

FOR EXAMINER'S USE ONLY.

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1	21	
2	11	
3	8	
Total Score	**40**	

Q1. You are provided with:

- Aqueous sulphuric acid labelled solution A
- Solution B containing 8.0g per litre of sodium carbonate.
- Solution C containing sodium hydroxide.

You are required to determine the concentration of solution A , and use the diluted solution to find the concentration of solution C.

Procedure1.

Using a pipette, place 25.0cm^3 of solution A into a 250ml volumetric flask. Add distilled water to make 250cm^3 of solution – Label this solution D. Place solution D in a burette. Clean the pipette and use it to place 25.0cm^3 of solution B into a conical flask. Add 2 drops of **methyl orange** indicator provided and titrate with solution D. Record your results in the table below. Repeat the titration two more times
and complete the table.

	I	**II**	**III**
Final burette reading			
Initial burette reading			
Volume of solution D used (cm^3)			

(4marks)

a) Evaluate the:

i) Average volume of solution D used. (1mark)

ii) Concentration of sodium carbonate in solution B. (1mark)
(R.A.M. Na=23, C=12, O=16)

b) Write the equation of the reaction that occurs (1mark)

……

c) Calculate the :

i) Moles of sodium carbonate reacting with sulphuric acid. (1mark)

ii) Concentration of sulphuric acid in solution D. (2 marks)

iii) Concentration of sulphuric acid in solution A. (2 marks)

Procedure 2.
Place solution D in a burette. Clean the pipette and use it to place 25.0cm^3 of solution C into a conical flask. Add 2 drops of **phenolphthalein**indicator provided and titrate with solution D. Record your results in the table below. Repeat the titration two more times and complete the table.

	I	**II**	**III**
Final burette reading			
Initial burette reading			
Volume of solution D used (cm^3)			

(4marks)

d) Evaluate theAverage volume of solution D used. (1mark)

e) Write the equation of the reaction that occurs (1mark)

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f) Calculate the :

i) Moles of sodium hydroxide reacting with sulphuric acid. (1mark)

iv) Concentration of sodium hydroxide in solution C in moles per litre. (2 marks)

Q2. You are provided with:
Solution **F**, which is 1M sodium Hydroxide solution,
Solution **G**, which is 1M hydrochloric acid solution.
You are required to find the Heat of neutralisation of sodium hydroxide.

Procedure:
Measure 50cm^3 of solution F into a plastic beaker and record its temperature.
Measure 50cm^3 of solution G and record its temperature.
Pour solution F into the beaker containing solution G.
Stir thoroughly and record the highest temperature attained by the mixture.
Record your results in the table below.

Temperature of A (^{o}C)	
Temperature of B (^{o}C)	
Highest temperature (^{o}C)	

(3 marks)

Temperature change ($\Delta\Theta$)…… (2 marks)
(Show clearly how you got your answer)

a) Calculate

i) The Heat evolved in the reaction (2 marks)

(Take the specific heat capacity & density of water to be 4.2Kj/Kg/K & 1g/cm^3)

ii) The number of moles of sodium hydroxide that react (1 mark)

iii) The molar enthalpy of the reaction (2 marks)

b) Write a thermo-chemical equation of the reaction that occurs (1mark)

Q3. You are provided with liquid P; carry out the tests described below.
a) Place a little amount of liquid P in a metallic spatula and ignite it in a Bunsen burner flame.

Observation	**Inferences**
(1 mark)	(1 mark)

b)Divide the remaining liquid into 3 portions.

i) To the first portion add three drops of acidified potassium dichromate

Observation	**Inferences**
(1 mark)	(1 mark)

ii) Add an equal volume of distilled water to the the 2nd portion followed bya spatula-end full of sodium carbonate

Observation	**Inferences**
(1 mark)	(1 mark)

iii) Add about $3cm^3$ of ethanoic acid to the 3rd portion followed by 3 drops of sulphuric acid and warm.

Observation	**Inferences**
(1 mark)	(1 mark)