

# FOCUS A365

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FORM 3 TERM 1 chemistry pp3 EXAMINATIONS 2018

NAME: \_\_\_\_\_ ADM NO: \_\_\_\_\_ CLASS: \_\_\_\_\_

## INSTRUCTIONS TO CANDIDATES

- 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 2  $\frac{1}{4}$  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.
- All working must be clearly shown.

## FOR EXAMINER'S USE ONLY

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1	23	
2	04	
3	05	
4	08	
<b>TOTAL SCORE</b>	<b>40</b>	

1. You are provided with:
  - 0.2 M Sodium Hydroxide solution
  - A M hydrochloric acid solution A
  - B M Na<sub>2</sub>CO<sub>3</sub> solution B

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

### **PROCEDURE I**

Using a pipette transfer 25cm<sup>3</sup> 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.

(4 mks)

Titre	I	II	III
Final burette reading (cm <sup>3</sup> )			
Initial burette reading (cm <sup>3</sup> )			
Volume of A used (cm <sup>3</sup> )			

a) What is the average volume of solution A used?

(1 mk)

b) Write a chemical equation for the reaction. (1mk)

c) Calculate the number of moles of solution A required to completely neutralize 25cm<sup>3</sup> of sodium hydroxide solution.

(2 mks)

d) What is the morality of the hydrochloric acid, solution A?

(2 mks)

### **PROCEDURE II**

Rinse the pipette thoroughly then pipette 25cm<sup>3</sup> of sodium carbonate into a conical flask. Add 2-3 drops of METHYL ORANGE 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 25cm<sup>3</sup> of the sodium carbonate. Record your results in the table below.

(4 mks)

Titre	I	II	III
Final burette reading (cm <sup>3</sup> )			
Initial burette reading (cm <sup>3</sup> )			
Volume of A used (cm <sup>3</sup> )			

e) What is the average volume of hydrochloric acid used in the second procedure?

(1 mk)

- f) What are the colour changes observed in procedure II (1mk)
- g) Write an equation for the reaction above. (1mk)
- h) Calculate number of moles of hydrochloric acid in the average volume. (2mks)
- i) Calculate the number of moles of sodium carbonate in 25cm<sup>3</sup> of solution. (2 mks)
- j) Calculate the concentration of sodium carbonate in moles per litre. (2 mks)
2. You are provided with solid P.  
Place all the solid in a dry test tube and heat gently. Allow the products to cool and then add water.  
Record all the observations and inferences or conclusions.
- Observations. (3mks)
- Inference (1mk)

3. You are provided with solid Q.

Place all the solid in a test tube and add about  $3\text{cm}^3$  of distilled water.

a) Shake well and record the observation and inference. Retain the solution.

Observation (1mk)

Inference (1mk)

b) Using the solution in (a) above, add about  $1\text{cm}^3$  of sodium chloride solution and heat gently. Record all the observation and inferences.

Observations. (2mks)

Inference (1mk)

4. You are provided with solid R. carry out the tests below and record all the observations and inferences.

a) Identify the colour of the solid.

i) Observation (1mk)

ii) Inference (1mk)

b) Place about  $\frac{1}{2}$  of the solid in a dry test-tube, heat gently and any gas produced with a burning splint.

i) Observation (2mks)

ii) Inference (1mk)

c) Place the remaining half of solid R in a test-tube. Add about  $2\text{cm}^3$  of 1M hydrochloric acid and test for any gas produced with a burning splint.

Observations. (2mks)

Inference (1mk)