



**ELIZADE UNIVERSITY**

**ILARA-MOKIN**

**ONDO STATE**

**FACULTY: BASIC AND APPLIED SCIENCES**

**DEPARTMENT: PHYSICAL AND CHEMICAL SCIENCES**

**SECOND SEMESTER EXAMINATIONS**

**2013/2014 ACADEMIC SESSION**

**COURSE CODE:** CHM 202  
**COURSE TITLE:** Analytical Chemistry  
**DURATION:** 1 hour and 30 minutes

A rectangular box containing a handwritten signature in black ink.

**HOD's SIGNATURE**

**TOTAL MARKS: 60**

**PRACTICAL EXAM**

**INSTRUCTIONS:**

This paper consists of two sections;

- Answer only one (1) question in Section A
- Answer all the questions in section B
- Remember to fill in your personal details on the first page of the answer booklet.

## SECTION A [30 marks]

### Question One

Specimen A is a solution of an impure salt of NaOH, Titrate 25 cm<sup>3</sup> of the solution with 0.05 M sulphuric acid using phenolphthalein indicator 2 drops. At the phenolphthalein end point record the titred value ( $V_p$ cm<sup>3</sup>), then add methyl orange indicator (2 drops) into the solution and continue the titration to the end point. Note and record the titred values ( $V_m$ cm<sup>3</sup>).

- a. Write the equation of the reaction completed at the two end points and derive the following

relationships:  $VCO_3^{2-} = 2(V_m - V_p)$

$$VOH = 2V_m - V_p$$

- b. What are the disadvantages of attempting to use sodium hydroxide as a standard base  
c. From your result evaluate the total Alkalinity, hydroxide and carbonate content  
d. Calculate the percentage of hydroxide converted to carbonate using relationship:

$$\% \text{ Conversion} = \frac{\text{Carbonate Content} \times 100}{\text{Total Alkalinity}} \quad [30 \text{ marks}]$$

### Question Two

Specimen B is an impure sample of sodium chloride. Carefully weigh 0.5g of the sample and dissolve it in 100cm<sup>3</sup> of distilled water. Add a pinch of calcium carbonate and make further addition until effervescence ceases and introduce 1 to 2 cm<sup>3</sup> of 5 % potassium chromate and titrate with standard silver nitrate to the first permanent appearance of a brick red colour due to silver chromate. Record the volume of AgNO<sub>3</sub> used. Repeat the procedure in triplicate and find the average titred value..

Calculate following;

- a. A. Number of moles of chloride  
b. Percentage of NaCl in the sample

[30 marks]