ELIZADE UNIVERSITY, ILARA – MOKIN, ONDO STATE, NIGERIA
DEPARTMENT: PHYSICAL AND CHEMICAL SCIENCES
FIRST SEMESTER EXAMINATIONS: 2020/2021 ACADEMIC SESSION
COURSE CODE: CHM 391 COURSE TITLE: EXPERIMENTAL CHEMISTRY III
HOD's SIGNATURE

DURATION: 3HOURS

INSTRUCTIONS: PERFORM THE EXPERIMENT OUTLINED BELOW AND ATTEMPT ALL THE QUESTIONS

You are provided with the following reagents and apparatus

I. *Labelled Water sample*
II. *0.01M HCl solution*
III. *Distilled water*
IV. *Phenolphthalein indicator*
V. *Methyl orange indicator*
VI. *Pipette*
VII. *Burette with retort stand*
VIII. *Measuring cylinder*
IX. *Beakers*
X. *Conical flask*

Perform the experiment described below:

1. *Measure 25mL of your sample into a conical flask. Add 2 drops of phenolphthalein solution. Note the colour change. Titrate your sample with 0.01M HCl. Note the colour of your solution at the endpoint. Record the volume of acid used for titration as (P)*
2. *To the same sample, add 2 drops of methyl orange, record the colour change and continue to titrate until the colour changes. Record the volume of acid used as (T) Repeat all procedures until you get reproducible result.*

Tabulate your titre values.

a. *Write balanced chemical equations for the reactions using*
   i. *phenolphthalein indicator*
   ii. *methyl orange indicator*
b. *Calculate the total alkalinity of your water sample in mg $CaCO_3$/ L of water*
c. *Calculate the alkalinity due bicarbonate and hydroxide ions*
d. *What is alkalinity of water*
e. *What is the significance of this experiment?*
f. *Tabulate alkalinity relationship.*