



**ELIZADE UNIVERSITY**

**ILARA-MOKIN**

**ONDO STATE**

**FACULTY: Basic and Applied Sciences**  
**DEPARTMENT: Physical and Chemical Sciences**  
**SECOND SEMESTER EXAMINATIONS**

**2015/2016 ACADEMIC SESSION**

**COURSE CODE: CHM 202**

**COURSE TITLE: ANALYTICAL CHEMISTRY 1**

**DURATION: 1h 30mins**

*m. O. O. O.*  
*15*

**HOD's SIGNATURE**

**TOTAL MARKS: 60marks**

**Matriculation Number: \_\_\_\_\_**

**INSTRUCTIONS:**

1. Write your matriculation number in the space provided above and also on the cover page of the exam booklet.
2. This question paper consists of 1 page with printing on both sides.
3. Answer all questions in the exam booklet provided.
4. More marks are awarded for problem solving method used to solving problems than for the final numerical answer.
5. Box your final answers. Marks will be deducted for untidy work.
6. At the end of this examination, place the question paper inside the exam booklet.
7. Attempt any (3) of the eight (5) questions

### Question One [20 Marks]

- a. With reference to any suitable example, explain the terms analyte and matrix [4marks]
- b. Differentiate between the following pairs: [2marks]
- i. Qualitative and Quantitative methods of analysis [2marks]
  - ii. Wet chemical and instrumental methods of analysis [1mark]
  - iii. Which of the pairs of these analytical methods will adequately characterize a given sample? [1mark]
  - iv. Which of these methods of analysis can also be referred to as classical method of analysis? [6marks]
- c. What is analytical strategy? Enumerate all the important steps involved in the strategy? [2marks]
- d. i. Compare and contrast the terms molarity and normality [2marks]
- ii. What is the molarity of a solution that has 4.5 mol of solute dissolved in 300.0 mL of solution? [2marks]

### QUESTION TWO [20 marks]

- a. Fill in the blank with an appropriate material that can be dissolved by the under listed solvents and reagents. [1mark]
- a. Hydrochloric acid \_\_\_\_\_ [1mark]
  - b. Nitric acid \_\_\_\_\_ [1mark]
  - c. Sulfuric acid \_\_\_\_\_ [1mark]
  - d. Hydrofluoric acid \_\_\_\_\_ [1mark]
  - e. Aqua regia \_\_\_\_\_ [1mark]
  - f. Perchloric acid \_\_\_\_\_ [1mark]
  - g. Water \_\_\_\_\_ [1mark]
  - h. Flux \_\_\_\_\_ [1mark]
- b. Suggest the best possible way(s) to preserve and maintain the integrity of the following substances after sampling: [1mark]
- i. Environmental water samples to be analyzed for metals [1mark]
  - ii. Environmental water samples to be analyzed for phosphate [1mark]
  - iii. Environmental water samples analyzed for nitrate [7marks]
- c. Mention all the preparatory activities that must be conducted on solid material prior to analysis. Give a brief explanation on any **one** of the activities mentioned [2marks]

### QUESTION THREE [20 marks]

- a. Differentiate between solid-liquid extraction and liquid-liquid extraction [8marks]
- b. What do you understand by Purge- and- trap method of extraction [4marks]
- c. i. What is experimental error in analytical science. [2marks]
- ii. Name the two major categories of error and differentiate between them [6marks]
- d. i. Compare and contrast 'Loss on drying' and 'Weight loss' [2marks]
- ii. What is the percent loss on drying if a sample weighs 4.5027 g before drying and 3.0381 g after drying? [3marks]

### QUESTION FOUR [20marks]

- a. Describe the various categories of solids that may be determined in water and waste water samples [12marks]
- b. A sample of lake water is tested for suspended solids and the following data are obtained. How many milligrams of suspended solids are there per liter of sample? [6marks]
- Volume of water used = 100.00 mL  
Weight of empty, dry filter = 0.1028 g  
Weight of dried Gooch crucible after filtering the water = 0.3837 g
- c. Of what importance is each of the following to gravimetric determination? [2marks]
- i. Chemical alteration of sample before separating analyte.
  - ii Gravimetric factor