



# KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS**  
**2017/2018 ACADEMIC YEAR**  
**SECOND YEAR 2ND SEMESTER**  
**SUPPLEMENTARY EXAMINATIONS**  
**FOR THE DEGREE OF B.ED (SCIENCE)**

**COURSE CODE:** SCH 220

**COURSE TITLE:** ANALYTICAL CHEMISTRY I

**DURATION:** 2 HOURS

**DATE:** 2017 17/10/2018

**TIME:** 11:30-1:30PM

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## INSTRUCTIONS TO CANDIDATES

- Answer **QUESTION ONE** (Compulsory) and any other two (2) Questions.
- Indicate **answered questions** on the front cover.
- Start every question on a new page and make sure question's number is written on each page.

This paper consists of **2** printed pages. Please Turn Over



## SECTION A

1.
  - a) State the principles of electrophoresis (3mks)
  - b) Differentiate between batch extraction and continuous extraction as used in solvent extraction (4mks)
  - c) What is Nernst partition or distribution law? (2mks)
  - d) Describe the term recrystallization as used in analytical chemistry. (3mks).
  - e) Name seven physio-chemical properties upon which separation techniques are based (4mks)
  - f) Explain the reason why results are compared in analytical chemistry (3mks)
  - g) Analysis of sample of copper ore gave the following percentage value for the copper content, 6.08, 6.21, 6.12, 6.09, 6.16, and 6.14. calculate
    - i. Mean (3mks)
    - ii. Standard deviation (4mks)
    - iii. Coefficient of variation (3mks)

## SECTION B

2.
  - a) An analyst is set to reduce systematic errors during the analysis. Discuss five ways which the analyst can use. (10mks)
  - b) The following values were obtained for the determination of cadmium in a sample of dust; 4.3, 4.0, 3.2  $\mu\text{g/g}$ . should the value 3.2 be rejected? (5mks)
  - c) Differentiate among the following
    - i. Relative error and absolute error (3mks)
    - ii. Variance and coefficient of variation (2mks)
3.
  - a) Discuss the seven basic steps followed by analysts in order to solve analytical problems (10mks)
  - b) What are the five advantages of instrumental methods of analysis? (5mks)
  - c) Explain how a sample plan is implemented by an analytical chemist. (5mks)
4.
  - a) Sampling is a very important aspect in analytical chemistry. Differentiate among the following sampling techniques stating the advantages one has over the other.
    - i. Random sampling (3mks)
    - ii. Judgmental sampling (3mks)
    - iii. Stratified sampling (3mks)
  - b) Differentiate among the following
    - i. Grab sample and composite sample (3mks)
    - ii. Systematic errors and random errors (3mks)
  - c) If the mean of 12 determinations is  $\bar{x} = 8.37$  and the true value is  $\mu = 7.91$ . Say whether or not this result is significant if the standard deviation is 0.17. (5mks)