



# KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS  
2020/2021 ACADEMIC YEAR

FIRST YEAR SECOND SEMESTER  
MAIN EXAMINATIONS

FOR THE DEGREE OF B.SC AND B.ED (SCIENCE)

**COURSE CODE:** SCH 122

**COURSE TITLE:** INTRODUCTION TO ANALYTICAL  
CHEMISTRY

**DATE:** 15/07/2021

**TIME:** 9:00-11:00AM

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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



*KIBU observes ZERO tolerance to examination cheating*

**Question 1 (30 marks)**

- a) Differentiate between qualitative and quantitative analysis as used in analytical chemistry. **(3 marks)**
- b) Discuss any three applications of analytical chemistry **(5 marks)**
- c) Analytical problems have got solutions. Whenever you are faced with an analytical problem how will you make a choice for the method to use? **(4 marks)**
- d) State the meaning of each of the following terms as used in chemistry: **(5 marks)**
  - i. Analysis
  - ii. Analytes
  - iii. Matrix
  - iv. Determination
  - v. Measurement
  - vi. Technique
- e) State the importance of a sampling plan **(1 mark)**
- f) Differentiate between systematic and random errors. **(4 marks)**
- g) State three applications of gravimetric analysis **(3 marks)**
- h) Describe the preparation of 5.0l of 0.1 M sodium carbonate from the primary standard **(3 marks)**
- i) Identify two separation techniques whose basis of separation is size **(2 marks)**

**Question 2 (20 marks)**

- a) The solutions of all analytical problems, both qualitative and quantitative, follow the same basic pattern. This may be described under seven general headings. Discuss the solutions under the seven headings. **(15 marks)**
- b) Discuss the advantages of instrumental methods of analysis **(5 marks)**

**Question 3 (20 marks)**

- a) During analysis errors are inevitable, explain how systematic errors can be reduced during analysis. **(15 marks)**
- b) Analysis of iron ore gave the following percentage values for the iron content. 7.08, 7.21, 7.12, 7.09, 7.16, 7.14, 7.07, 7.14, 7.18, 7.11. Calculate the mean standard deviation and coefficient of variation for the values. **(5 marks)**

**Question 4 (20 marks)**

- a) Explain the procedure for precipitation gravimetry. **(14 marks)**
- b) What are the applications of gravimetric analysis? **(3 marks)**
- c) Differentiate between titration and a titrant as used in volumetric analysis **(3 marks)**