



# KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS  
2019/2020 ACADEMIC YEAR

FIRST YEAR FIRST SEMESTER  
SUPPLEMENTARY EXAMINATIONS

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

**COURSE CODE:** SCH 320

**COURSE TITLE:** ANALYTICAL CHEMISTRY II

**DURATION:** 2 HOURS

**DATE:** 3/02/21

**TIME:** 11-1 Pm

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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 3 printed pages. Please Turn Over



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**Question 1(30 marks)**

- a) Define the following terms:-
- i. Partition coefficient (2marks)
  - ii. Gravimetry (2marks)
  - iii. Titration (2marks)
- b) Give three examples of a mobile phase in gas chromatography. (3marks)
- c) What is the criterion for a good primary standard? (4marks)
- d) How is particle size controlled in precipitation analysis? (4marks)
- e) Differentiate between column and planar chromatography. (4marks)
- f) State two application of acid base titration. (2marks)
- g) Explain how selectivity is achieved in solvent extraction (2marks)
- h) You are required to separate components of a mixture based on change of physical state. Outline three techniques which you can use to accomplish this task. (3marks)
- i) Apart from change in physical state and particle size, name other physicochemical properties upon which separation and concentration of species are based. (2marks)

**Question 2 (20 marks)**

- a) What are the separation techniques which are based on particle size? (4marks)
- b) Discuss solvent extraction under the following topics
- (i) Principles (2marks)
  - (ii) Apparatus (2marks)
  - (iii) Applications (2marks)
  - (iv) Disadvantages. (2marks)
- c) Explain how recrystallization works as a method of separation. (6marks)

**Question 3 (20 marks)**

- a) In order to determine the concentration of a standard an analyst can do it directly or indirectly. Explain how this can be done:
- i. Direct method (4marks)

- ii. Indirect method **(4marks)**
- b) Sketch a conductometric titration curve for a strong acid and a strong base **(3marks)**
- c) An analyst is required to carry out an experiment using 5 litres of 0.1M sodium carbonate. Advise the analyst how the solution should be prepared from a primary standard. **(3marks)**
- d) Redox titration is an important titrimetric technique. State its applications **(6marks)**

**Question 4 (20 marks)**

- a) Briefly give the meaning of the following terms as used in volumetric analysis;-
- i. Titrant **(2marks)**
  - ii. Standardization. **(2marks)**
  - iii. Primary standard **(2marks)**
  - iv. End point. **(2marks)**
- b) Briefly discuss thin layer chromatography and paper chromatography basing your discussion on the principles
- i. Thin layer chromatography **(6marks)**
  - ii. Paper chromatography **(6marks)**