



KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER
SUPPLEMENTARY EXAMINATIONS

FOR THE DEGREE OF B.ED (SCIENCE)

COURSE CODE: SCH 321

COURSE TITLE: INSTRUMENTAL METHODS OF ANALYSIS

DURATION: 2 HOURS

DATE: 16/10/2018 **TIME:** 8:00-10:00AM

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



SECTION A

1.

- a) State the meaning of the following terms in relation to instrumentation;
 - i. Analytical technique (2mks)
 - ii. Procedure (2mks)
 - iii. Protocol (2mks)
- b) Discuss the limitations of instrumental analysis (4mks)
- c) What is the function of the flame in flame photometry (3mks)
- d) What are the advantages of Atomic Emission Spectroscopy when non-flame excitation sources are used (4mks)
- e) What is the purpose of an internal standard in Flame Emission Spectroscopy (2mks)
- f) How is the sample prepared in flame photometry? (4mks)
- g) Draw a schematic diagram for Atomic Absorption Spectroscopy (5mks)

SECTION B

2.

- a) What are the applications of flame photometry in pharmaceutical analysis (5mks)
- b) State the limitations of flame photometry (4mks)
- c) State the function of the following instrument parts in AAS.
 - i. Chopper (2mks)
 - ii. Detector (2mks)
- d) Identify any two types of interferences encountered in AAS (2mks)
- e) Compare and contrast AES and AAS (5mks)

3.

- a) Several interferences are encountered in AAS. Explain how each of the interferences are overcome (10mks)
- b) What is the principle behind ultraviolet visible spectroscopy? (3mks)
- c) Discuss the fourier transform infrared spectroscopy under the following;
 - i. Instrumentation
 - ii. Principles

4.

- a) The following are thermal method of analysis. For each briefly discuss the principle and instrumentation
 - i. Thermogravimetric analysis (TGA) (4mks)
 - ii. Thermomechanical analysis(TMA) (4mks)
 - iii. Differential scanning colourimetry (DSC) (4mks)
- b) What is mass spectrometry ? (3mks)
- c) X-ray diffractometry (XRD) is a method of analysis by use of x-rays. Discuss XRD outlining clearly the principle instrumentation and applications (5mks)