KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2016/2017 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER
SUPPLEMENTARY/SPECIAL EXAMINATIONS

FOR THE DEGREE OF B.ED (SCIENCE)

COURSE CODE: SCH 321

COURSE TITLE: INSTRUMENTAL METHODS OF ANALYSIS

DURATION: 2 HOURS

DATE:26TH SEPTEMBER 2017 TIME: 8 – 10 AM

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)