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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

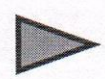
DURATION: 2 HOURS

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 calorimetry (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)