



25

KIBABII UNIVERSITY
UNIVERSITY EXAMINATIONS
2016/2017 ACADEMIC YEAR
THIRD YEAR FIRST SEMESTER
MAIN EXAMINATIONS
FOR THE DEGREE OF B.ED (SCIENCE)

COURSE CODE: SCH 322

COURSE TITLE: ADVANCED INSTRUMENTAL ANALYSIS

DURATION: 2 HOURS

DATE: 19TH JANUARY 2018 TIME: 9 -11AM

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



- 1.
- a) Differentiate among the following terms as used in instrumental analysis:
 - i. Analytical technique and analytical method (3mks)
 - ii. Procedure and protocol (2mks)
 - b) A careful consideration of the analyte, sample, and instrumentation are critical in the development of a valid instrumental method. In doing this a number of factors come into play. Explain how the following points need to be considered:
 - i. Properties of the sample (3mks)
 - ii. Analyte properties (3mks)
 - iii. Anticipated concentration range of the analyte (3mks)
 - iv. Sample preparation (3mks)
 - c) Explain two ways in which a signal is generated within instruments (4mks)
 - d) A chemist wanted to analyze for lead in blood samples and get immediate results:
 - i. What name is given to such analysis? (1mk)
 - ii. Explain the importance of such results to the analyst. (4mks)
 - e) There are several advancement which have influenced the working of analytical chemists. Outline one such advancement. (4mks)
- 2.
- a) Discuss the functions of each of the following components of a computer:
 - i. Central processing unit (5mks)
 - ii. The memory (3mks)
 - iii. The out-put and in-put devices (4mks)
 - b)
 - i. What is a microcomputer? (1mk)
 - ii. How has it affected the working of analytical chemists (5mks)
 - c) State two strategies in which a computer communicates with instruments and analysts. (2mks)
- 3.
- a) What are hyphenated techniques? (2mks)
 - b) List any five hyphenated techniques (5mks)
 - c) What is an interface and how is it important? (3mks)
 - d) Differentiate among the following:
 - i. Instrument and machine (2mks)
 - ii. Oscilloscope and operational amplifiers (2mks)
 - iii. Digital meters and analogue meters (2mks)
 - iv. Data and information (2mks)
 - v. Input transducer and output transducer (2mks)
- 4.
- a) What are the ideal properties of an operational amplifier (4mks)
 - b) Explain how operational amplifiers are useful to chemists (7mks)

- c) Briefly discuss the limitations of instrumental methods
- d) Briefly discuss electrochemical techniques

(6mks)

(3mks)