



# TECHNICAL UNIVERSITY OF MOMBASA

---

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**DIPLOMA IN ANALYTICAL CHEMISTRY**

**: ACH2204: INSTRUMENTAL METHODS OF ANALYSIS 1**

**PAPER 2**

**SPECIAL/SUPPLEMENTARY EXAMINATION**

**SERIES: SEPTEMBER 2018**

**TIME: 2HOURS**

**DATE: Pick Date Sep 2018**

## Instructions to Candidates

You should have the following for this examination

*Answer Booklet, examination pass and student ID*

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

---

## Question ONE

- a. Define the following terms: (6marks)
- (i). Noise
  - (ii). Signal
  - (iii). Signal to noise ratio
- b. Highlight four examples of classical separation methods. (4marks)
- c. The types of electromagnetic radiation are broadly classified into various classes, Name any four. (4marks)
- d. State the major sequence of events in spectrophotometer. (3marks)

- e. State the Beer-Lamberts law (2marks)
- f. Draw a simplified schematic diagram of a double beam UV- visible spectrophotometer. (10marks)
- g. State one application of spectrophotometry. (1mark)

### Question TWO

- a. State the physical and chemical property that determines the choice of a suitable instrument for analysis. (10marks)
- b. What are the limitations of the instrumental methods of analysis? (5marks)

### Question THREE

- a. Name two methods that are used to improve noise-to-signal ratio in an analytical instrument. (2marks)
- b. State and explain the main steps that are performed during a chemical analysis. (10marks)
- c. Outline the importance of each of the following parts in an analytical equipment:  
(i). Detector  
(ii). Transducer  
(iii). Readout (3marks)

### Question FOUR

- a. What is an electromagnetic spectrum? (3marks)
- b. Name any three classes of electromagnetic radiations. (3marks)
- c. Infrared is part of the electromagnetic radiation that is divided into three classes. State and explain each of the classes. (9marks)

### Question FIVE

Draw a well labeled diagram of a single beam spectrophotometer, and briefly explain its principles of operation. (15marks)