Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF TECHNOLOGY IN APPLIED CHEMISTRY

BTAC

ACH 4202:   ANALYTICAL INSTRUMENTATION I

SPECIAL/SUPPLEMENTARY EXAMINATION

OCTOBER 2013 SERIES
2 HOURS
Instructions to candidates:

This paper consist of **FIVE** questions
Answer question **ONE** (compulsory) and any other **TWO** questions

Question ONE

a) In instrumental analysis how does bandwidth affect spectrophotometric accuracy

   (4marks)

b) Give any FOUR classification of instruments   **(4marks)**

c) List FOUR factors that affect sensitivity of an instrument   **(4marks)**

d) Difference between limit of detection and limit of quantitation   **(2marks)**

e) Define the following

   (i)   Selectivity   **(2marks)**

   (ii)   Sensitivity   **(2marks)**

(iii)   Linear dynamic range   **(2marks)**

f) Using the following data calculate the mean, standard deviation and range.

Sample	1	2	3	4	5	6	7	8	9
Concentration lig/g	0.07	0.07	0.08	0.07	0.07	0.08	0.08	0.09	0.08

Question TWO

a) Describe how fourier analysis helps in reduction of noise   **(5marks)**

b) Explain FIVE various sources of noise in analytical instrumentation   **(15marks)**

Question THREE

a)   State motivation factors for carrying out measurements   **(5marks)**

b) Mention any FIVE routine checking in a spectrometer   **(5marks)**

c) Stray light is one of the factors that affect photometric accuracy, give FIVE different sources of stray light.   **(10marks)**

Question FOUR

a) Define the term amplifier and explain how it helps to reduce noise   **(3marks)**

b) Using a schematic diagram explain basic functions of an instrument   **(7marks)**

c) State and explain the factors that affect beer lamberts law.   **(10marks)**

Question FIVE

a) Define the term noise figure   **(2marks)**

b) State the two methods of achieving signal enhancement   **(2marks)**

c) Give TWO advantages and two disadvantages of automation in instrumentation **(4marks)**

d) How does RC filters help in noise reduction   **(12marks)**