



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCE

DEPARTMENT OF APPLIED CHEMISTRY

ANALYTICAL CHEMISTRY III

SCH 4206

First Semester Examination Paper

December 2014

This examination paper consists of 3 pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: DR H. Chiririwa

INSTRUCTIONS

1. Answer any five (5) questions
2. Each question carries 20 marks
3. Use of calculators is permissible

MARK ALLOCATION

QUESTION	MARKS
1.	20
2.	20
3.	20
4.	20
5.	20
6.	20
TOTAL	100

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SCH 4206

1. (a) Draw a flow diagram which illustrates the steps involved in a typical quantitative analysis [10 marks]
- (b) Define the following terms:
- i) sampling
 - ii) assay
 - iii) gross sample
 - iv) laboratory sample
 - v) replicate sample [10 marks]
2. (a) Discuss the sources of errors in decomposition and dissolution [12 marks]
- (b) List and explain the four general methods of decomposing solid and liquid samples to obtain aqueous solutions of analytes. [8 marks]
3. (a) Discuss the differences and advantages that microwave digestion has over wet ashing using conventional heating. [10 marks]
- (b) How are samples decomposed by inorganic acids in open vessels? [10 marks]
4. You are assigned to investigate the extent of lead contamination in soil samples. Discuss the possible sources of lead contamination in the environment, and the effects of lead on human health. Explain how you would design a quantitation method for the determination of lead taking into account that it is present in the sample in trace concentration. [20 marks]

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5. (a) In the analysis of environmental samples, briefly describe what the following terms mean and how are they determined experimentally?
- (i) Total Organic Content (TOC) [5 marks]
 - (ii) Chemical Oxygen Demand (COD) [5 marks]
- (b) What is a masking agent and how does it function? [5 marks]
- (c) What are the steps involved in obtaining a laboratory sample? [5 marks]
6. (a) In the analysis of water samples which test methods cover the determination of acidity or of alkalinity in all types of water? [6 marks]
- (b) Discuss the interferences that can be found in water samples [14 marks]

End of question Paper!!!

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