



**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**DEPARTMENT OF APPLIED CHEMISTRY**  
**SUPPLEMENTARY EXAMINATION: TTE – AUGUST 2013**  
**ANALYTICAL CHEMISTRY III – SCH 4206**

**TIME: 3 HOURS**

**INSTRUCTIONS TO CANDIDATES**

Answer **ANY FOUR** questions out of **FIVE** questions provided.

Each question carries 25 marks.

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1. (a) What is a masking agent and how does it function? [10 marks]
- (b) What are the steps involved in obtaining a laboratory sample? [15 marks]
  
2. (a) Describe the source of error in decomposition and dissolution of samples. Give practical examples. [10 marks]
- (b) Explain the difference between wet ashing and dry ashing. [10 marks]
- (c) What are that advantages of microwave digestion. [5 marks]
  
3. (a) What are the sources of interference in an analytical procedure? Describe any two techniques which are used to manage interferences. [10 marks]
- (b) The  $K_d$  for a weak acid between water and diethyl ether is found to be 800 and its  $K_a$  in water is  $1.50 \times 10^{-5}$ . Calculate the analytical concentration of HA remaining in an aqueous solution after 50.0ml of 0.0500M HA is extracted with 25.0ml of ether, assuming the aqueous solution is buffered to a pH of (a) 2.00 and (b) 8.00. [15 marks]
  
4. (a) In analytical chemistry, what is an interferent and how is it dealt with.? Give practical examples in your explanations. [15 marks]
- (b) Describe any two classical separation techniques, also indicate their drawbacks. [10 marks]

5. (a) Differentiate between:

(i) Sorbed water, adsorbed water and occluded water. [9 marks]

(ii) Essential water and non-essential water. [5 marks]

(iii) Gross sample and laboratory sample. [5 marks]

(iv) Total Oxygen Demand(TOC) and Chemical Oxygen Demand(COD)

[6 marks]

**End of question Paper!!!**