

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF APPLIED CHEMISTRY

END OF SECOND SEMESTER EXAMINATIONS – APRIL/MAY 1999

ANALYTICAL CHEMISTRY III - SCH 4206

TIME: THREE HOURS

INSTRUCTIONS TO CANDIDATES

Answer *All* questions. Total marks = 100.

1. After obtaining a representative sample, what other problems can arise before the actual analysis e.g in water analysis. (15 marks)
2. What is:
 - (i) Characteristic concentration.
 - (ii) Indicative concentration. (5 marks)
3. Draw a modular diagram (flow chart) of a gas chromatograph – mass spectrometer. Given that its interface is a jet device that takes advantage of the high – velocity carrier molecules (He/H_2) to let them diffuse into surrounding vacuum the lower velocity and much larger momentum of the more massive analytes will cause them to enter the input port of the mass spectrometer. After species entering the mass spectrometer are ionized. The resulting ions are accelerated and separated to give a mass spectrum. (15 marks)
4. In instrumental analysis, what are the important steps considered useful when a measurement is made on a sample. (You can give an example). (15 marks)
5. How many replicate measurements are worth making on a sample in the interest of better precision? Explain your answer. (10 marks)
6. When should one be concerned with the validity of a measurement. Explain giving the example of a pH measurement which was developed for aqueous solution, and is based on the glass electrode, to acetone solution (non-aqueous). (20 marks)
7. If lead in the environment is being studied, even trace concentrations of Pb in standards should be avoided. If Pb is found, what steps can be taken to deal with it? What additional sources of contamination should be checked for lead to avoid unmeasured blanks? (20 marks)

END OF QUESTION PAPER!!!!