VPM's ADVANCED STUDY CENTRE

POST GRADUATE DIPLOMA IN APPLIED ANALYTICAL CHEMISRTY

(Final Examination 2005-2006)

Date: 27.03.2006 **PAPER – I**

Time : 5.00 – 8.00 p.m. Marks: 100

Note: 1) All questions are compulsory. 2) Use of log tables or nor programmable calculator is allowed

Q.1) Write short answers for the following:

i) Define Analytical Chemistry. What do you mean by qualitative and quantitative analysis? 03

ii) Define the terms : a) partial analysis b) trace analysis c) complete analysis 03

iii) Define accuracy and precision. 02

iv) What is meant by standardization in volumetric analysis? 02

v) What is primary standard and secondary standard? Give appropriate examples. 04

vi) What do you mean by normal phase and reverse phase chromatography? 02

vii) What is ISO? 02

viii) What is meant by inline & online configuration in automated analysis? 02

Q.2) Answer **any One** of the following: 20

a) What is volumetric analysis? Calculate pH during various stages of titration for titration of strong acid against strong base. Construct the titration curve from pH values and discuss suitable indicators for the same. What is the effect of concentration on selection of indicators?

b) What is quality and quality assurance? Explain the importance of quality assurance with reference to chemical industry.

Q.3) Answer **any Two** of the following: 20

a) What do you mean by non-aqueous titration? Why it is necessary and what are the solvents used for the same. Explain with suitable examples.

b) What is Kaizen? Explain in detail the Five S programme.

c) Explain the importance of automation of analytical laboratory.

Q.4) Answer **any Four** of the following: 20

a) What do you mean by GMP and GLP? Explain importance of GLP in analytical chemistry.

b) Explain the classification of different methods of chemical analysis. What is meant by classical and instrumental analysis?

c) The solubility of silver chloride is 0.0015 gm/dm^3, calculate solubility product (mole. wt. of AgCl = 143.3)

d) What is meant by synergistic extraction? What are the different mechanisms by which metal gets extracted into organic phase?

e) Explain in brief TQM.

f) How will you prepare following solutions:

i) 50 ml of 0.25 M HCl ii) 150 ml of 0.1 N H_2SO_4

iii) 250 ml of 0.2 N $K_2Cr_2O_7$ solution (mole.wt.= 294.19)

iv) 500 ml of 0.5N KMnO4 (mole.wt. = 158.04)

Q.5) Write short notes on **any Five**: 20

i) ISO 9000 ii) Common ion effect and its role in chemical separation

iii) Buffer solution iv) Sampling & its importance in pharmaceutical industry

v) Limitation of quality control laboratory

vi) Why no suitable indicator is available for titration of weak acid against weak base?

vii) What is the pH of following solutions:

0.01 M HCl, 0.025 M CH_3COOH ($ka = 1.8 \times 10^{-5}$)

0.2 M NaOH, 0.3 M NH_4OH ($Kb = 1.8 \times 10^{-5}$)

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