M.Sc.-I (Chemistry)(with Credits)-Regular-Semester 2012 (Old) / (CBCS Pattern) Sem I

CHE-104 / PSCCHT04-Paper-IV : Analytical Chemistry

P. Pages : 2 **GUG/S/18/3421**

Time : Three Hours * 0 6 0 4 * Max. Marks : 80

Notes : 1. All questions are compulsory.
2. All questions carry equal marks.
3. Use of calculator is allowed.

1. a) Give the classification of instrumental methods of Analysis? Discuss different types of molecular analysis for qualitative and Quantitative applications? **8**

b) What is meant by significant figures explain with examples? **8**
Following values are obtained for % M_n in rock
Sample :- 5.66, 5.67, 5.33, 5.75, 5.46, 5.77.
Calculate Average Deviation and standard deviation.

OR

c) Explain F-test and 4d-rule with examples? **4**

d) What is confidence limit? Explain with examples? **4**

e) What are errors? Discuss determinate & Indeterminate errors with examples? **4**

f) Following values are obtained for concentration of from in water sample : 11.2, 11.6, 11.0, 11.1 ppm. Predict whether the result 11.6 be rejected or retained using Q-test and 2.5d rule. $Q_{90\%}$ for observations = 0.765. **4**

2. a) Explain the principle and technique used in paper chromatography? Give its classification & applications? **8**

b) Explain the principle of solvent extraction? Discuss any four factors affecting extraction efficiency? **8**

OR

c) A mixture containing two components 'A' and 'B' is to be separated chromatographically. If R_f values of the two components are 0.75 and 0.70 respectively. What distance should solvent travel in order to achieve resolution of 1 cm. **4**

d) Explain the principle of "Ion exchange chromatography'. **4**

e) Explain the principle & technique used in thin layer chromatography. **4**

f) Discuss extraction of solids by Soxhlet extractor? **4**

3. a) Define "Indicator Range"? How is it useful in selecting a proper indicator for a given acid base titration? **8**

b) Explain in details the general steps involved in Gravimetric Analysis? **8**

OR

c) Discuss Redox titration with examples? Calculate equivalent weight of $K_2G_2O_7$ in acidic medium using chemical reaction? **4**

d) Explain Co-precipitation and Post-precipitation? **4**

e) Explain the theory of complexometric titrations? **4**

f) Explain the role of 'Policeman' and describe the term incineration in details? **4**

4. a) Describe the Job's method and mole Ratio method for determination of molar composition of complexes with examples? **8**

b) Draw the diagram of a typical UV-Visible spectrometer and discuss its role in determination of pK-value of an Indicator? **8**

OR

c) Explain photometric titration with suitable examples. **4**

d) Discuss Relative errors in spectrophotometry with the help of Ringbom plot? **4**

e) The molar absorptivity of a particular solute is 2.1×10^4. Calculate transmittance through a cuvette with a 5.00cm light path for a 2.00×10^{-6}M. Solution. **4**

f) Discuss the factors responsible for deviation from the Beer's law? **4**

5. a) Define. **2**

i) Mean; ii) Median;
iii) Accuracy & iv) Precision.

b) Distinguish between Average Deviation and standard derivation? **2**

c) Define the chromatographic parameter R_f, R_x & R_m. **2**

d) What the ion exchange capacity. **2**

e) Explain synergistic effect. **2**

f) What are photomultiplier tubes. **2**

g) What are external, internal & Self-indicator? **2**

h) How Amino acids reparation is done using Thin-layer chromatography. **2**

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