

M.Sc.- I (Chemistry) (CBCS Pattern) Semester-I  
**PSCCHT04 - Analytical Chemistry**

P. Pages : 2

Time : Three Hours



**GUG/W/24/11186**

Max. Marks : 80

1. a) Calculate the correlation coefficient from following set of data interpret your data: 8

Concentration of dye (mm)	1.0	2.0	3.0	4.0	5.0	6.0
Absorbance	1.2	1.05	0.92	0.77	0.63	0.50

- b) Discuss the following: 8  
i) Confidence limit  
ii) Significant figures.

**OR**

- c) Explain correlation coefficient in brief. 4  
d) Discuss determinate error. 4  
e) What is error? Give its classification. 4  
f) Two students analysed sample of gold and obtained following results. 4

A -	107.861,	107.870,	107.881,	107.892
B -	107.777,	107.778,	107.779,	107.780

Calculate mean, standard deviation and confidence limit.

2. a) Explain principle and technique of ion exchange chromatography. 8  
b) Discuss the factors affecting on extraction efficiency. Explain cryptands in solvent extraction. 8

**OR**

- c) Explain the principle of thin layer Chromatography. 4  
d) Explain the role of chelating ligands in solvent extraction. 4  
e) Discuss in brief synergistic extraction. 4  
f) If the volume of an aq. Solution of benzoic acid of known strength be 1000 ml and that of ether added each time be 200ml. Find the amount of acid left unextracted in water at the end of third extraction. The partition coefficient of acid between water and ether is  $\frac{1}{80}$ . 4

3. a) What is gravimetric analysis? Explain the general principle of Gravimetric analysis. What are conditions of precipitation in gravimetric analysis. 8

- b) Discuss the criteria for reactions used in titrations. Explain primary and secondary standards. 8

**OR**

- c) Discuss solubility and solubility product. 4
- d) Explain masking and demasking agent. 4
- e) Discuss in brief co-precipitation & post precipitation. 4
- f) Explain complexometric titration with titration curve. 4
4. a) Draw and explain instrumentation for single beam spectrophotometer. 8
- b) Discuss in details composition and stability constant of complex by Job's method. 8

**OR**

- c) What is Beer's law. Derive the expression for Beer's law. 4
- d) Discuss comparison method for quantitative estimation. 4
- e) Discuss the role of organic ligands in spectrophotometric analysis of metal ions. 4
- f) Calculate the absorptivity of compound with molecular weight = 144 if  $1 \times 10^{-5}$  g/ml solution exhibits and absorbance of 0.400 when optical path is unity. 4
5. a) Define accuracy and precision. 2
- b) What is certified reference material. 2
- c) What is calixarenes. 2
- d) What is the role of crown ethers in extraction. 2
- e) What are indicator? 2
- f) Discuss ignition of precipitates. 2
- g) What is Sandell's sensitivity. 2
- h) State Lambert's law. 2

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