

M.Sc. I (Chemistry) (CBCS Pattern) Sem-I  
**PSCCHT04 - Analytical Chemistry Paper-IV**

P. Pages : 2

Time : Three Hours



**GUG/W/22/11186**

Max. Marks : 80

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1. a) Give the classification of instrumentation methods? Discuss different types of molecular analysis for qualitative and quantitative analysis. **8**
- b) What are errors? Give classification of errors with examples. **8**
- OR**
- c) Explain F-test and Q-test in detail. **4**
- d) Write a short note on certified reference material. **4**
- e) Write rules to decide significant figure. Find out significant figure in 0.015 and 2.003. **4**
- f) Analysis of sample of Mn ore gave following percentages for the Mn contain is 7.08, 7.21, 7.12, 7.09, 7.16, 7.14, 7.07, 7.14, 7.18 & 7.11 calculate median and standard deviation. **4**
2. a) Explain the principle of paper chromatography? Give its classification and applications. **8**
- b) What are ion-exchange resin? Give general structure of cation and anion exchange resin. Explain Zeolite as a ion-exchanger. **8**
- OR**
- c) Explain the principle and techniques used in column chromatography. **4**
- d) Explain the role of crown ether and cryptands in solvent extraction. **4**
- e) Explain in detail solid phase extraction. **4**
- f) Explain application of TLC in qualitative and quantitative analysis. **4**
3. a) Explain general principle of volumetric analysis? Discuss different types of titration with examples. **8**
- b) Explain in detail general steps involve in gravimetric analysis? **8**
- OR**
- c) Explain masking and demising agent. **4**
- d) Explain theory of indicators. **4**
- e) Explain co-precipitation and post precipitation? **4**
- f) Discuss titration curves for monoprotic acids and bases. **4**

4. a) Explain principle of colorimetry? State and explain Beer's law, its verification and deviation. **8**
- b) Draw the diagram of a typical UV-Visible Spectrometer and discuss its role in determination of PK value of indicator? **8**

**OR**

- c) Write a note on Sandell's Sensitivity. **4**
- d) Explain photometric titration with examples. **4**
- e) Explain comparison method for quantitative estimation. **4**
- f) Define Transmittance and molar extinction coefficient. The absorption of a solution containing 5.0 mg of a solute per litre is 1.0 in a 1 cm cell, calculate Extinction coefficient and molar extinction coefficient. **4**
5. a) Define accuracy and Precision. **2**
- b) Explain the term confidence limit. **2**
- c) Explain the term fluent and Chromatogram. **2**
- d) What is synergistic effect? **2**
- e) Explain Peptisation phenomenon with example. **2**
- f) Define fractional precipitation. **2**
- g) What are photomultiplier tube? **2**
- h) Give two difference between colorimeter and spectrophotometer. **2**

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