

M.Sc.- I (Chemistry) CBCS Pattern Semester-I
PSCCHT04 - Paper-IV : Analytical Chemistry

P. Pages : 2

Time : Three Hours



GUG/W/23/11186

Max. Marks : 80

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1. a) Give the classification of instrumental analysis of method. 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) What is correlation coefficient and confidence limit? **4**
- d) Write notes on additive and proportional error with example. **4**
- e) Write rules to decide significant figure. Find out significant figure in 0.011 and 2.006. **4**
- f) Following data obtained for concentration of Iron in water sample. 11.2, 11.6, 11.0, 11.1, predict whether the result 11.6 be rejected using Q-test. Q-value for 4 observations is 0.76. **4**
2. a) Explain the principle of paper chromatography? Give its classification and applications. **8**
- b) Write a note on. **8**
- i) Solid phase extraction.
- ii) Microwave assisted extraction.

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) How do you determine ion exchange capacity of cation exchanger in H⁺ form? **4**
- f) Explain application of TLC in qualitative and quantitative analysis. **4**
3. a) Explain the quinonoid theory of acid-base. Explain the titration curve for monoprotic acid and base. **8**
- b) Explain in detail general steps involved in gravimetric analysis. **8**

OR

- c) Explain masking and demasking agent. **4**
- d) Discuss complexometric titration. Explain the role of EBT indicator. **4**
- e) Explain Co-precipitation and post-precipitation. **4**
- f) Explain aging and peptization phenomenon. **4**

4. a) Explain principle of colorimetry. State and explain Beer's law, its verification and deviation. **8**
- b) Describe Jobs method and Mole ratio method for determination of molar composition of complexes with example. **8**

OR

- c) How the organic ligand useful in spectrophotometric analysis of metal ion explain. **4**
- d) Explain photometric titration with examples. **4**
- e) Explain molar extinction method and comparison method for quantitative estimation. **4**
- f) The absorbance of KMnO_4 solution and its λ_{max} is 0.62 in 2.0 cm cell. The molar absorptivity of permanganate at same λ_{max} is 225. Calculate the concentration of KMnO_4 solution. **4**
5. a) Define accuracy and precision. **2**
- b) What is certified reference material? **2**
- c) What is Nernst distribution law. **2**
- d) What is synergistic effect? **2**
- e) What is primary and secondary standard? **2**
- f) Define fractional precipitation. **2**
- g) Draw diagram of single beam spectrophotometer. **2**
- h) Give two difference between colorimeter and spectrophotometer. **2**
