

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIRST SEMESTER – NOVEMBER 2022

17/18UCH1MC02 – ANALYTICAL CHEMISTRY

Date: 03-12-2022

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

PART – A

Answer ALL Questions.

(10 x 2 = 20)

1. Differentiate accuracy from precision.
2. Indicate the number of significant figures in the following.
(i) 100.01 (ii) 0.00400
3. State the law of volumetric analysis.
4. Identify the following as primary or secondary standards
(a) potassium dichromate (b) sodium carbonate
(c) potassium permanganate (d) hydrochloric acid.
5. Define the term 'gravimetric factor'.
6. What are adsorption indicators? Give an example.
7. Define R_f value.
8. List the adsorbents used in column chromatography.
9. Mention any two applications of TGA.
10. Draw the TGA curve of silver nitrate.

PART – B

Answer any EIGHT Questions.

(8 x 5 = 40)

11. Write the general rules to be followed for the storage and handling of chemicals.
12. Mention the importance of MSDS of a chemical.
13. Explain the laboratory first aid procedure.
14. What are the characteristics of a primary standard? Cite an example for primary and secondary substances.
15. Suggest a suitable indicator for the titration of
(i) HCl Vs Na_2CO_3 (ii) Cl^- Vs Ag^+ (iii) Zn^{2+} Vs EDTA (iv) $\text{H}_2\text{C}_2\text{O}_4$ Vs NaOH
(v) $\text{H}_2\text{C}_2\text{O}_4$ Vs KMnO_4
16. Calculate the pH of the following. (i) 0.001 N HCl (ii) 0.1 N NaOH.
17. Derive the relationship between solubility and solubility product.
18. Write a short note on coprecipitation and post precipitation.
19. What is recrystallization? Explain the various steps involved in it.

20. Sketch schematically the distillation apparatus setup for the distillation of two miscible liquids and explain the principle involved in it.
21. Sketch and explain the TGA curve of calcium oxalate monohydrate.
22. Explain the various factors affecting the size and shape of a thermogram.

PART – C

Answer any FOUR Questions.

(4 x 10 = 40)

23. Explain the different types of error. How can they be minimized?
24. Calculate the arithmetic mean, average deviation and standard deviation for the following burette readings 21.3, 20.7, 20.1, 19.5, 20.5 and 20.9 mL.
25. (a) Define Molarity. Calculate the molarity of a solution containing 12.6 g of oxalic acid dihydrate crystals in 500 mL of water.
(b) Explain the principle of Zn^{2+} vs EDTA titration. **(5+5)**
26. What are argentometric titrations? Explain the principle and procedure involved in the estimation of chloride ions by Volhard's method.
27. Explain in detail how the components of a mixture can be separated using column chromatography.
28. Discuss the principle, instrumentation and applications involved in the DTA technique.

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