LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **CHEMISTRY**

FIRST SEMESTER – NOVEMBER 2011

CH 1502 - ANALYTICAL CHEMISTRY

Date : 08-11-2011 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

PART – A

Answer ALL questions: (10 x 2 = 20 marks)

1. How should ethyl ether be stored?
2. Round 1.00727 four, three and two significant figures.
3. What is meant by accelerated solvent extraction?
4. What is van Deemter equation?
5. All of the iodide in a 19.81 mL portion of a calcium iodide solution is precipitated with 12.55 mL of 0.1850 M $AgNO_3$.What is the molarity of CaI_2?
6. What is gravimetric factor?
7. What is the difference between direct titration and a back titration?
8. What are metallochromic indicators? Give an example.
9. What are the advantages of DTA over TGA?
10. What quantity is measured in TGA and in DTA?

PART – B

Answer any EIGHT questions: (8 x 5 = 40 marks)

11. The magnesium content of H_2O samples was found to be 60, 60, 61, 62, 63, 63, 63, 64, 64, and 70 mg /L. Calculate the standard deviation.
12. What are systematic errors? Would they affect the precision or accuracy?
13. What are the general rules observed in the storage and handling of chemicals?
14. Explain any five factors affecting the solvent extraction.
15. What is visualization process in chromatography? What are the chemicals used in this process?
16. Discuss the principle of distillation under reduced pressure.
17. 0.2535 g of a sample of sodium oxalate consumed 40.20 mL of 0.0730N $KMnO_4$ in acid medium. Calculate the percentage of sodium oxalate in the sample.
18. Explain quinonoid theory of acid-base indicators.
19. Calculate the pH of a buffer solution containing 0.01 M NH_3 (aq) and 0.02M NH_4NO_3 (aq) (K_b = 1.8 X 10^{-5} for aq NH_3).

20. What are adsorption indicators? Explain giving an example.

21. Discuss the factors that affect the size of particles of precipitate in gravimetric analysis

22. Draw and explain the TG curve for calcium oxalate monohydrate.

PART – C

Answer any FOUR questions: **(4 x 10 = 40 marks)**

23. What are different types of errors? How can they be minimized?

24. Explain in detail how the components of a mixture can be separated using column chromatography.

25. a) Derive Henderson equation. (5)

    b) In the titration of 15.00 mL of 0.200 M NaOH with 0.100 M HCl, calculate the pH for Va = 0, 2.00, 20.00and 30.00 mL. (Va is the volume units of acid). (5)

26. Distinguish between co precipitation and post precipitation. Discuss the various mechanisms by which co precipitation can occur.

27. a) How is chloride determined by Volhard method? (5)

    b) Explain the functioning of FID in GC. (5)

28. a) Write a brief description of DTA apparatus. (5)

    b) Write briefly on the factors that affect a thermogram. (5)

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