LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIRST SEMESTER – **NOVEMBER 2016**

16UCH1MC02/CH 1505/1502/5501 – ANALYTICAL CHEMISTRY

Date: 07-11-2016   Dept. No.   Max. : 100 Marks
Time: 01:00-04:00

PART -A

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

1. Suggest a suitable first aid to be followed when acid is swallowed.
2. Express the significant figures for the following.
   i. 0.00200   ii. 99.9
3. What are primary standards? Give an example.
4. State the law of volumetric analysis.
5. What are adsorption indicators? Give an example.
6. Define post precipitation.
7. Calculate the normality of oxalic acid when 0.63g of oxalic acid is dissolved in 100 mL of distilled water.
8. List the adsorbents used in Column chromatography.
9. Mention the property measured in TGA and DTA.
10. Sketch the TGA curve of $AgNO_3$.

PART -B

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

11. Calculate the standard deviation for the following five titre values.

    4.95, 5.00, 5.04, 5.11 and 4.90 mL

12. List the general rules to be borne in mind in storage and handling of chemicals.

13. Discuss the principle and applications of Paper chromatography.

14. What are the advantages of precipitation from homogenous medium?

15. Suggest an indicator for the titration of

    a) HCl vs Na_2CO_3 b) Cl^- vs Ag^+ c) Mg^{2+} vs EDTA d) $H_2C_2O_4$ vs NaOH

    e) Fe^{2+} vs $K_2Cr_2O_7$.

16. State and explain the Henderson's Hassel Bach equation.

17. Discuss the factors that affect thermograms.

18. 25 mL of 0.1 N sulphuric acid is exactly equivalent to 20 mL of KOH solution. What is the concentration of KOH expressed in normality?

19. Explain the principle of complexometric titration with a suitable example.

20. Sketch the thermogram of calcium oxalate monohydrate. Discuss the principle of TGA.

21. Calculate the solubility of $PbSO_4$. Given $K_{sp} = 1.6 \times 10^{-8}$ at 25^oC

22. What is von Weiman ratio? Define the terms in it.

PART -C

23. a) Discuss the quinonoid theory of acid-base indicators .

    b) Calculate the pH of 0.01 N and 0.0001 N HCl.

24. How is chloride determined by Volhard's method?

25. What are absolute and relative errors? Give the methods of minimizing errors.

26. Explain the principle, technique and applications of Gas chromatography.

27. a) Discuss the instrumentation of thermogravimetric analysis.

    b) Sketch and explain the DTA curve of $CaC_2O_4 . H_2O$

28. a) Explain the principle of thin layer chromatography. What are the advantages of TLC

      over paper chromatography?

    b) What are metal ion indicators? Explain their characteristics.

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