LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **CHEMISTRY**

FIRSTSEMESTER – APRIL 2018

17PCH1MC04- ANALYTICAL CHEMISTRY

Date: 30-04-2018 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

Part-A

Answer ALL questions. **(10 × 2= 20)**

1. What are the differences between accuracy and precision?
2. Highlight the significances of correlation coefficient.
3. Write Van Deemter equation and mention the terms involved in it.
4. State the principle of GLC.
5. Write the significance of autoprotolysis constant of solvents.
6. Calculate the normality of a solution consisting of 10 mL of 0.2 N HCl and 10 mL of 0.1 M NaOH.
7. Write the Nernst equation. Explain the terms involved in it.
8. Draw DTA thermogram for the decomposition of calcium oxalate mono hydrate.
9. Mention the advantages of turbidimetry
10. Compare the efficiencies of premix and total consumption burners in AAS.

Part-B

Answer any EIGHT questions. **(8 × 5= 40)**

11. Explain any three methods of elimination of errors.
12. Explain how student's t-test is used to test the significance of the difference between the means of the sample.
13. What are the different types of sample injection systems used in HPLC? Explain any two methods.
14. Explain the principle of column chromatography technique.
15. Discuss the working principle of thermal conductivity detector with a diagram.
16. Write a note on masking agents in complexometric titrations.
17. Describe the characteristics of aprotic, protophilic, protogenic and amphiprotic solvents.
18. Discuss the factors that influence TGA curves.
19. How is DTA used to study the stability of $CuSO_4.5H_2O$?
20. Describe the electrogravimetric estimation of copper.
21. Write a note on the chemical and spectral interferences in AAS.
22. How is codeine-morphine mixture determined by fluorimetry?

Part-C

Answer any FOUR questions. **(4 × 10= 40)**

23a. What are systematic and random errors? How can they be minimized?

b. A sample of water is analyzed for magnesium content by two different methods A and B. If the standard deviation of each method is S_A=0.21 and S_B=0.15 respectively, then identify the method which is more precise by applying F-test.Given F_{crit}=2.30.

24. State and explain the principle and instrumentation of capillary electrophoresis.

25a. What are non aqueous titrations? Write a note on the reactions of ethanol as non-aqueous solvent.

b. What are the molarity and molality of a 13% solution (by Weight) of Sulphuric acid? Its density is 1.090 g/ mL. To what volume should 100 mL of this acid be diluted in order to prepare 1.5 N solution. (5+5)

26a. How is the equilibrium of Fe^{2+}/Fe^{3+} - Ce^{3+}/Ce^{4+} system studied using potentiometry?

b. Write a comparative account of thermogravimetry techniques. (5+5)

27a. Write a note on Coulumetric analysis.

b. Explain the principle of FES. (5+5)

28a. How is lead in petrol determined by AAS? .

b. What is spectrophotometric titration? How is Fe(III) determined using EDTA by spectrophotometry ? (5+5)

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