LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – **APRIL 2015**

CH 924 – ANALYTICAL CHEMISTRY

Date : 23/04/2015 Dept. No. Max. : 100 Marks

Time : 09:00-12:00

PART-A

Answer all questions. Each question carries two marks. **(10 x 2 = 20)**

1. Differentiate accuracy from precision.
2. What are transducers?
3. Mention the factors that affect the solubility of a substance.
4. Write the principle involved in the estimation of barium as barium sulphate by gravimetric analysis.
5. Define confidence interval.
6. What is EDTA? Mention its application in titrimetric analysis.
7. Define quantum yield of a photochemical reaction.
8. Name any two carrier gases used in gas chromatography.
9. How does coulometry differ from potentiometry?
10. Mention the role of supporting electrolyte in polarography.

PART-B

Answer any eight questions. Each question carries five marks. **(8 x 5 = 40)**

11. a. What is a Q-test?
    b. The analysis of a calcite sample yielded CaO percentage of 55.95, 56.00, 56.04, 56.08, and 56.23. The last value appears anomalous. Should it be retained or rejected at 95% confidence interval ($Q_{Critical}$ at 95% CI is 0.71)?
12. Write a note on homogeneous precipitation.
13. What are metallochromic indicators? Give an example with the structure.
14. Differentiate masking and demasking agents with suitable examples.
15. Explain ion-exchange chromatography technique.
16. What are redox indicators? Mention their significance by citing examples.
17. What are inorganic and organic precipitating agents? Give examples.
18. Describe Craig experiment and write the applications of Craig extraction.
19. Explain diffusion and limiting currents with the help of current-voltage curve.
20. State Beer-Lambert's Law. Mention its limitations.
21. Explain the principle of AAS and mention its applications.
22. Write Ilkovic equation. Explain the terms in it and its applications.

PART-C

Answer any four questions. Each question carries ten marks. **(4 x 10 = 40)**

23. a) Discuss the types of errors in chemical analysis. (5)
    b) Explain how determinate errors are detected and minimized. (5)
24. a) Explain the different types of columns used in GC. (5)
    b) Discuss any two types of spectrophotometric titrations with examples. (5)
25. Explain the principle of solvent extraction and fractional distillation with suitable examples.
26. Describe the principle involved in the estimation of copper by gravimetry and nickel by volumetry.
27. Discuss the spectral and chemical interferences encountered in the determination of metal ions by FES.
28. a) Draw and explain the ampereometric titration curves for Pb^{2+} vs CrO_4^{2-} titrations if the applied potential is maintained at half wave potential of Pb^{2+}. (5)
    b) What are the advantages and disadvantages of DME in polarography? (5)

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