LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

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

FIRST SEMESTER – **NOVEMBER 2024**

CH 1505 – ANALYTICAL CHEMISTRY

Date: 09-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

SECTION A

Answer ANY FOUR of the following **4 x 10 = 40 Marks**

1. List the general rules to be followed in the storage and handling of chemicals.
2. (a) Explain the various steps involved in recrystallization. (5)
   (b) Give the properties and uses of drying agents. (5)
3. Outline the principle, technique, and applications of ion-exchange chromatography.
4. Explain the primary and secondary standard solutions with suitable examples.
5. Derive Henderson equation for an acidic buffer and mention its significances.
6. What are adsorption indicators? Explain by giving an example.
7. (a) Write a note on Von Weimarn ratio. (5)
   (b) Explain the various factors affecting solubility of a compound. (5)
8. Explain the principle and instrumentation involved in the TGA technique.

SECTION B

Answer ANY THREE of the following **3 x 20 = 60 Marks**

9. (a) Calculate the mean, median, average deviation and coefficient of variation for the following observations: 29.0, 22.8, 23.1, 24.5, 25.5, and 20.1. (10)
   (b) Mention the importance of MSDS and COSHH of a chemical. (10)
10. (a) Explain the first aid procedure for acid spill, alkali spill and during fire accident in the laboratory. (10)
    (b) Differentiate between (i) accuracy and precision (ii) absolute and relative error. (10)
11. (a) Explain in detail how the components of a mixture can be separated using column chromatography. (10)
    (b) Sketch schematically the distillation apparatus setup for the distillation of two miscible liquids and explain the principle involved. (10)
12. (a) Explain the different types of titrations with an example for each. (10)
    (b) Suggest an indicator for the titration of (10)
    (i) HCl vs Na_2CO_3 (ii) Mg^{2+}vs EDTA (iii) $H_2C_2O_4$ vs NaOH (iv) $H_2C_2O_4$ vs $KMnO_4$
13. (a) Explain the principle and procedure involved in the determination of chloride using Volhard's method. (10)
    (b) Write a short note on co-precipitation and post precipitation. (10)
14. (a) Discuss the principle, instrumentation and applications of DTA. (10)
    (b) Sketch and explain the thermogram of calcium oxalate monohydrate and silver nitrate.
