Roll.No. | 25UCHCT1002

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Chemistry - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - I
25UCHCT1002 - Analytical chemistry-I

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Explain the general precautions to be followed in the laboratory to avoid accidents while handling corrosive, flammable, and toxic chemicals.
2. Explain the following
   i)Normality ii)mole fraction
3. Analyze the difference between coprecipitation and post-precipitation in gravimetric analysis. Justify with suitable examples how they affect the accuracy of results.
4. Apply the Henderson–Hasselbalch equation to calculate the pH of a buffer solution containing 0.1 M acetic acid and 0.1 M sodium acetate. Show the steps clearly.
5. Summarize the uses of common laboratory apparatus such as volumetric flasks, burettes, pipettes, and desiccators, highlighting their role in accurate chemical analysis.
6. Differentiate between primary and secondary standards.
7. Illustrate the theories of precipitation and demonstrate how precipitation from a homogeneous medium minimizes errors in gravimetric analysis.
8. Evaluate the relative strengths of acetic acid ($K_a = 1.8 \times 10^{-5}$) and ammonium hydroxide ($K_b = 1.8 \times 10^{-5}$).Justify which one is a stronger electrolyte based on their dissociation constants.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Discuss the storage, handling, and safe disposal methods of hazardous chemicals. How do threshold vapour concentration limits and proper fume disposal contribute to laboratory safety?

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10. Analyze the different types of errors in chemical analysis and justify the methods used to minimize them.
11. Demonstrate the working principle of complexometric titration using EDTA and illustrate the role of complexometric indicators with an example.
12. a) Evaluate the essential characteristics of a good precipitate and precipitating agent.
    b)Discuss the role of sequestering agents in controlling precipitation with suitable examples.
13. Discuss the importance of eliminating interfering anions during group separation of cations in qualitative analysis. Justify with examples how failure to remove these ions may lead to incorrect identification of cations.

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