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 - NOV'2024
SEMESTER - I
22UCHCT1002 - Analytical Chemistry

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

Section B

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

1. List any three types of hazardous chemicals and give their safe storage and handling methods.
2. Discuss theories of acid-base indicators by citing phenolphthalein as an example.
3. How does the solubility of a precipitate affect the accuracy of gravimetric analysis, and what measures can be taken to minimize this effect?
4. Describe the eliminations of phosphate and oxalate.
5. State the purpose of following laboratory apparatus:
   (i) volumetric flasks (ii) desiccators (iii) rubber policeman
   (iv) burettes (v) pipettes.
6. Calculate the amount of $K_2Cr_2O_7$ required to prepare the solutions of following concentrations.
   (i) 0.5 N (ii) 0.1 M (iii) 5%
7. Explain how co-precipitations affect the results of gravimetric analysis. Provide an example.
8. Arrive at Henderson equation to calculate pH of an acidic buffer solution.

Section C

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

9. (i) Describe first aid techniques in detail. (5 mark)
   (ii) Illustrate the strategies of waste disposal to be followed in the laboratory.
10. (i) Classify errors and discuss elaborately. (6)
    (ii) A set of seven measurements of the pH of a solution are given as follows: 6.2, 6.5, 6.8, 7.1, 7.3, 7.5, and 7.8. Calculate the standard deviation of the pH measurements. (4)

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11. Distinguish between
    (i) primary and secondary standards
    (ii) iodometric and iodimetric titrations
    (iii) molecular weight and equivalent weight
    (iv) redox and complexometric titrations.

12. (i) Evaluate the characteristics of an ideal precipitating agent in gravimetric analysis. How do DMG meet these criteria? (5 mark)
    (ii) Critically assess the role of sequestering agents in gravimetric analysis. (5 mark)

13. (i) Discuss the implications of the solubility product on the precipitation of sparingly soluble salts and explain the principles behind the common ion effect. (5 mark)
    (ii) Evaluate the strengths and limitations of buffer solutions and discuss the importance of pH control in certain situations. (5 mark)

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