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 APRIL-2023
SEMESTER - VI
20UCHCT6015 - Physical Chemistry

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

Section B

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

1. Define equivalent conductance and molar conductance and explain variation of conductance with dilution.
2. Explain the terms: i) emf (1+2+2)
   ii) Standard electrode potential
   iii) Liquid junction potential
3. Predict the feasibility of the following reaction:
   $2Ag_{(s)} + Zn^{2+}{}_{(aq)} \rightarrow Ag^{+}{}_{(aq)} + Zn_{(s)}$
   ($E^{0}{}_{anode}$ = 0.80 V, $E^{0}_{cathode}$ = -0.763 V)
4. Explain various groups and subgroups.
5. Briefly explain buffer action and its application in human system.
6. Outline conductometric titration of weak acid against strong base.
7. Enumerate the applications of concentration cells in the determination of valency of ions and solubility product.
8. Determine the symmetry elements of ammonia molecule and find the point group.

Section C

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

9. Determine the transport number of an ion through Hittorf's method.
10. Outline Debye-Huckel theory and validate Onsager's equation.
11. a) Derive Nernst equation for electrode potential.
    b) Calculate the half cell potential of zinc electrode in 0.01 M $ZnSO_4$ solution at 25 °C. (E° = 0.0763 V)
12. Illustrate the determination of pH of a solution using quinhydrone electrode with a neat diagram.
13. Construct the group multiplication table for C_2v and C_2h point group based on its symmetry operations.

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