DINHATA COLLEGE

B.Sc. (CHEMISTRY) GENERAL ASSIGNMENT – 2018

SUBJECT – CHEMISTRY, PAPER – V

FULL MARKS: 45

Group – A (Inorganic)

1. (a) What are inner metallic complexes? Discuss with suitable example .the structure of inner metallic complexes are dependent on the pH of the solution, – explain. (2+1+1)=4

   (b) Which one is more stable and why?

   (i) $[Ni(NH_3)_6]\ Cl_2$ and (ii) $[Ni(en)_3]\ Cl_2$ 2.5

   (c) What are the differences between double salts and coordination complexes? 1

2. (a) How many isomeric structures are possible for $[Co(NH_3)_4Cl_2]Cl$? Draw the structures for each. 2

   (b) When a salt containing Ni^{2+} ion is treated with DMG solution in alkaline condition, a complex of DMG with Ni^{2+} will form with pink colouration. Draw the structure of that complex and show, how many coordinate bonds and hydrogen bonding inter actions produced in that complex? 2.5

   (c) Given the IUPAC Names of following –

   (i) $[Fe(NO)(H_2O)_5]SO_4$, (ii) $K_4[Fe(CN)_6]$, (iii) $[Pt(NH_3)_2Cl_2]$ 3 × 1 = 3

3. (a) Define mean, median and more. (3+1.5+3) = 7.5

   (b) Why the solution of $Na_2S_2O_3$ is called secondary standard solution?

   (c) What are the differences between iodometric and iodimetric titration? Discuss principle of iodometric titration of Cu(ii) ion.

Group – B (Physical)

[Answer to Question No.4 is compulsory and any two questions from the rest]

4. **Answer any four –**

(a) For a first order reaction, the half life of the reaction is independent of the initial concentration of reactant – Justify.

(b) For a strong electrolyte, the relative conductance decreases on dilution but under the same condition equivalent conductance increases, why?

(c) For a particle having mass of 1g and velocity 5×10^5 cm/sec. Calculate its wavelength.

(d) What will be pH of pure water at 100°C? Explain with proper justification.

(e) The aqueous solution of NaCl is neutral, where as the solution of sodium Acetate is alkaline in nature, why? $(2.5 \times 4) = 10$

5. (a) What do you understand by the term (i)Threshold energy and (ii)Activation energy? Draw a diagram and explain.

(b) The slope of lnk vs 1/T curve for a reaction is 2.55×10^4, Calculate the Activation energy for that reaction.

(c) Given an example of a zero order reaction.

(d) What are fluorescence and phosphorescence? Explain with the help of a diagram.

(3+3+1+3) = 10

6. (a) Mention at least one use of colloid in day to day life.

(b) Draw the neutralization graph and explain–

(i) CH_3 COOH solution by NaOH solution.

(ii) NaOH solution by CH_3COOH solution.

(c) Derive the mathematical equation to dictate relationship between relative and equivalent conductance . What is the significance of infinite dilution to determine conductivity of solution?

(d) Show that, under a certain condition Langmuir adsorption isotherm becomes same as Froundlich isotherm. (1+3+3+3) = 10

7. Write short notes on- $(3 \times 2) + (2 \times 2) = 10$

[Two from (a) and two from (b)]

(a) (i) Acid-base indicator, (ii) Photoelectric effect & (iii) Reversible and irreversible cell.

(b) (i) Einstein's low of photochemical equivalence, (ii) Partition functions &
(iii) Catalysts.