M.Sc. SEMESTER-III
Physical Chemistry- Practicals
CHNN-606-(P) & CHNN-607-(P)
Section –I (Minimum-05)

1. Determination of molecular radius of molecule of a molecule (organic liquid) using Refractrometer.
2. Determine Molar refractin of methyl acetate, ethyl acetate, n-hexane & CCl_4. Calculate the atomic reflactiion if C, H and Cl atoms.
3. Determine heat of transition and transition temperature for sodium sulphate decahydrate by thermometric methods.
4. Study the varitation of surface tention of solution of n-propyl alcohol with concentration and hence determine the limiting cross sectional area of alcohol molecule.
5. Titration of KI solution against $HgCl_2$ solution conductometrically.
6. Study the variation with composition of mixture of

a. Ethanol – Water, b. Methanol- ethylene diamine
Determine whether there is complex compound formation between two layers.

7. Determine the radius of molecule of sucrose by viscosity measurement.
8. Investigate solubility of component system & hence draw a tie line on binodal.
9. Separation of mixture of methylene blue Fluorescein on alumina column.
10. Separation of amino acids/proteins by electrophoresis.
11. Determine the ionzation constant of a weak acid (say Acetic acid) by conductometry.
12. Determine the strength of weak acid (CH_3COOH) by titrating it with a weak base (NH_4OH) conductometrically.
13. To study the effect of electrolytes on water structure by viscosity method.

Section –II (Minimum-05)

1. To Study the Influence of ionic strength on solubility of $CaSO_4$.
2. To Determine the isoelectric point of glycine by $_P$H metric.
3. Determine the standard electrode potential of Ag/Cu/Pb/Zn.
4. Estimate Na^+ or K^+ ion by flame photometer.
5. Separation of dyes TLC (any two)

   Malachite green Alizarin
   Crystal violet Methyl Orange

Cresol Red	Congo Red
Fast green	Sunset Yellow
Rhodamine B	Pela Red

6. Determine velocity constant, order of reaction, energy of activation for saponification ethyl acetate by sodium hydroxide conduct metrically.
7. Determination of solubility of Lead sulphate/ barium sulphate conduct metrically,
8. Determination of CMC and ΔG of sodium dodecyl sulphate conduct metrically.
9. Polarograpohic determination of Pb^{+}, Cd^{2+}, or Cu^{2+} ions.
10. Fluorimetric determination of Al^{3+}, Cd^{3+}, Ca^{2+} or Zn^{2+}
11. To determine the Normality and Dissociation Constant of the given acid by Potentiometry.
12. To determine the equilibrium constant for the reaction between Ag^{+} and NH_3 by Potentiometry.

Section –III (Minimum-05)

1. Investigation the reaction between iodine and acetone.
2. Study Kinetics between potassium persulphate and potassium iodinde by differential method.
3. To determine the solubility of Calcium in Presence of different concentration of KCl/HCl.
4. Investigation the complex ion formation between Fe(III) and thiocynate ion by job's method using spectrophotometer and find out (i) free energy (ii) stability constant
5. Determine the composition of the following binary mixtures by using spectrophotometer or Colorimeter following Additives rules (any Two)
   a)$COCl_2, 2H_2O$ + $NiCl_2, 6H_2O$, b)Crystal violet + Aurine c)$K_2Cr_2O_7$ + $KMnO_4$
6. Determine the concentration of Fe (III) solution by titration with EDTA spectrophossstometrically.
7. Spectrophotometric determination of lead on Leaves using solvent extraction.
8. Determination inorganic phosphorus in human urine or serum specrophotometrically.
9. Spectrophotometric titration of copper and Bismuth mixture by EDTA.
10. Construct the phase diagram for three component system (chloroform-aceticacid-Water).
11. To determine the concentration and dissociation constant of a given di-basic acid by pH metric titration.
12. To determine the acidic and basic dissociation constant of a given amino acid and its isoelectric point by pH metry.