(a) Determination of acetic acid in commercial vinegar using NaOH

(b) Determination of alkali content- antacid tablet using HCl.

(c) Estimation of calcium content in chalk as calcium oxalate using permanganate.

(d) Estimation of hardness of water by EDTA.

(e) Estimation of ferrous and ferric ions by dichromat methods.

(f) Estimation of copper using thiosulphate.

(g) Estimation of Mg^{2+}, Ca^{2+}or Ba^{2+}complexometrically.

OR

Gravimetric Analysis :

Analysis of Cu as CuSCN and Ni as Ni (dimethylgloxim

Note: **Candidates are required to prepare standar solutions by proper weighing.**

2. Thin Layer Chromatography :

Determination of R_f values and identification organic compounds.

(a) Separation of green leaf pigments (spinach leaves m be used)

(b) Preparation and separation of 2 dinitrophenylhydrazones of acetone, 2- butano

hexane-2-and 3-ones using toluene and light petroleum(40:60)

(c) Separation of a mixture of dyes using cyclohexane and ethyl acetate (8.5:1.5)

Paper Chromatography:

Determination of R_f values and identification of organic compounds in a mixture of amino acids / monosaccharides.

3. Identification of Organic Compounds:

An organic compound from the following list be given for systematic identification:

(i) Formic, Acetic, Propanoic and Butanoic acids.

(ii) Phenols- Phenol, Resorcinol, Hydroquinone, p-Cresol, α-Naphthol, β-Naphthol.

(iii) Alcohols- Methyl, Ethyl, Propyl,Isopropyl, n- butyl, isobutyl and tert. butyl alcohol.

(iv) Carboxylic acids- Oxalic, Tartaric, Citric, Succinic, Benzoic, Cinnamic, Salicylic, Phthalic acids

(v) Carbohydrates- Glucose, Fructose, Cane sugar and Starch.

(vi) Aldehydes- Formaldehyde, Acetaldehyde and Benzaldenyde.

(vii) Ketones- Acetone, Methyl ethyl ketone, Acetophenone and Benzophenone.

(viii) Nitro compounds - Nitrobenzene, p- Nitrotoluene and m- Dinitrobenzene.

(ix) Amino compounds - Aniline, o-, m-and p-toluidine, ∝-Naphthylamine and β-Naphthylamine.

(x) Anilides - Acetanilide and Benzanilide.

(xi) Amides - Acetamide, Benzamide and Urea.

(xii) Esters - Methyl acetate, Ethyl acetate.

(xiii) Thioamide - Thiourea.

(xiv) Hydrocarbons - Benzene, Toluene, Naphthalene and Anthracene.

(xv) Halogen containing compounds - Chloroform, Chloral hydrate, Iodoform, Chlorobenzene, p-Dichlorobenzene and p- Dibromobenzene.

4. **Physical chemistry experiments-** Any one of the following experiments may be given in the examination.

Chemical Kinetics:

(i) To determine the specific reaction rate of the hydrolysis of methyl acetate/ ethyl acetate catalyzed by hydrogen ions at room temperature.

(ii) To study the effect of acid strength on the hydrolysis of an ester.

(iii) To study kinetically the reaction rate of decomposition of iodide by peroxydisulphate.

(iv) To study the hydrolysis of an ester in presence of a base.

(iv) To determine the relative strength of two acids using ester hydrolysis.

Phase Equilibrium

(i) To study the effect of a solute (e. g. NaCl, succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. Phenol-water system) and to determine the concentration of that solute in the given phenol-water system.

(ii) To construct the phase diagram of two component (e. g. diphenylamine- benzophenone) system by cooling curve method.

Adsorption:

(i) To study the adsorption of acetic acid by activated charcoal and test the validity of Freundlich or Langmuir adsorption isotherm.

(ii) To study the adsorption of oxalic acid by activated charcoal and test the validity of Freundlich or Langmuir adsorption isotherm.

Books Recommended:

1. Practical chemistry - Giri, Bajpai and Pandey, S. Chand & Co. Ltd. New Delhi