

SECOND YEAR CHEMISTRY PRACTICALS

Distribution of Marks

Time 5 Hrs. (one day)	M.M. 50
	Marks
Exercises-	
1. Volumetric estimation	10
or	
Gravimetric analysis	
2. Determination of R_f values and identification of given organic compounds using thin layer / paper chromatography.	05
3. Identification of given organic compound through functional group analysis	10
4. Physical chemistry Experiments	10
5. Viva - Voce	07
6. Record	08
Total	50 Marks

List of Experiments

(1) Volumetric Analysis: (Any one of the following exercise may be given in the examination.)

Determination of acetic acid in commercial vinegar using NaOH

Determination of alkali content- antacid tablet using HCl.

Estimation of calcium content in chalk as calcium oxalate using permanganate.

Estimation of hardness of water by EDTA.

(e) Estimation of ferrous and ferric ions by dichromate 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 (dimethylglyoxime)

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

2. Thin Layer Chromatography :

Determination of R_f values and identification of organic compounds.

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

(b) Preparation and separation of 2,4-dinitrophenylhydrazones of acetone, 2-butanone,

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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 Benzaldehyde.

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

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

(ix) Amino compounds - Aniline, o-, m- and p-toluidine, α -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.

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(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

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- 2 Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern
- 3 Experimental Organic Chemistry Vol.I & II, P.R. Singh, D.S. Gupta & K.S. Bajpai, Tata Mc Graw Hill
- 4 Experiments in Physical Chemistry- J.C. Ghose, Bharti Bhawan
- 5 Experiments in General Chemistry, C.N.R. Rao & U.C. Agarwal, Eastern Press
- 6 Practical Chemistry- Suresh Ameta & P.B. Punjabi, Himanshu Publication.