SEMESTER I
S-1045-A

INORGANIC PRACTICALS

Duration 6 Hrs. (one day) **M.M. : 50**

Distribution of Marks:

Ex.I.	Qualitative analysis	18 Marks
	(3 marks for each radicals	
EX.II	Water Analysisc	12 marks
3.	Preparation/ Chromatrography	10 Marks
4.	Viva-Voce	10 Marks
	Total	**50 Marks**

List of Experiments -

1. Qualitative analysis - Qualitative analysis of inorganic mixture containing SIX radicals from the following list: (at least three from Group B)
Six mixtures are compulsory to be done during the session.

Group A - Carbonate, Sulphite, Sulphate, Sulphide, Nitrite, Acetate, Oxalate, Nitrate, Chloride, Iodide, Phosphate, Fluoride, Borate, Silver, Lead Mercury, Bismuth, Copper, Cadmium, Tin, Arsenic, Antimony, Aluminium, Chromium, Iron, Nickel, Cobalt, Zinc, Manganese, Calcium, Barium, Strontium, Magnesium, Ammonium.

Group B - Thiosulphate, Cyanate, Thiocyanate, Hypochlorite, Chlorate, Percholrate, Iodate, Persulphate, Silicate, Chromate, Arsenate, Benzoate, Thalium, Tungsten, Molybdenum, Vanadium, Beryllium, Uranium, Thorium, Titanium, Zirconium, Cerium.

2. Water Analysis -

Water analysis for hardness, BOD, COD, DO, available Chlorine, Floride and Iron

3. Preparation of any ten complexes

(i) $TiO(C_9H_8NO)_{2.2}H_2O$

(ii) Cis-$K[Cr(C_2O_4)_2(H_2O)_2]$

(i) $Na[Cr(NH_3)_2(SCN)_4]$
(ii) $Mn(acac)_3$
(iii) $K_3[Fe(C_2O_4)_3]$
(iv) Prussian Blue, Turnbull's Blue.
(v) $Co[(NH_3)_6][NO_2]_6$
(vi) Cis-$[Co(trien)(NO_2)_2]Cl.H_2O$
(vii) $Hg[Co(SCN)_4]$
(viii) $[Co(Py)_2Cl_2]$

(ix) $[Ni(NH_3)_6]Cl_2$

(x) $Ni(dmg)_2$

(xi) $[Cu(NH_3)_4]SO_4.H_2O$

(xii) $VO(acac)_2$

OR

Separation of cations and anions by paper chromatography/column chromatography/ ion exchange.

SEMESTER I
S-1045-B

ORGANIC PRACTICALS

Qualitative Analysis **Duration 6 Hrs. (one day)** **M.M. 50**

Distribution of Marks

Exercises

1. Experiment-I 15 Marks
2. Experiment-II 15 Marks
3. Experiment III 10 Marks
3. Viva-voce 10 Marks

Total 50 marks

1. **Separation**, Purification and identification of compounds in a binary mixture of two solids, Preparation of their suitable derivatives
2. **Organic Synthesis**

(One experiment to be performed from the following in the examination)

Acetylation- Acetylation of Salicylic acid using acetyl chloride

Benzoylation- Benzoylation of phenol/ aniline/ glycine

Oxidation- Phenanthroquinone from Phenanthrene

Sandmayer Reaction- p- Chlorotoluene from p-Toluidine

Acetoacetic ester Condensation- Synthesis of ethyl-n-butylacetoacetate

Cannizaro Reaction- Any p-substituted benzaldehyde as substrate

Backmann Rearrangement- Acetanilide from acetophenone

Claisen-Schmidt Condensation- Benzalacetophenone/ Bezalacetone/ diBenzalacetone from Benzaldehyde

3. Chromatography:

i..Separation of components by TLC

ii. R_f value determination and identification by adsorption paper chromatography (Descending and ascending)

SEMESTER I
Physical Chemistry
S-1045-C

Duration 6 Hrs. (one day) **M.M. 50**

Distribution of Marks

Exercises

1.	Experiment-I	20 Marks
2.	Experiment-II	20 Marks
3.	Viva-voce	10 Marks
	Total	**50 Marks**

Any exercise within the scope of the syllabus may BE ADDED /modified as per the requirement

1. Adsorption
2. To study adsorption behavior of different types of coal
3. To study adsorption behavior of different types of clay. and bio wastes
4. To study adsorption behaviour of different types of bio wastes
5. To study surface tension-concentration relationship

equation)

2. Phase equilibria

(i) Determination of congruent composition and temperature of a binary system (e.g. diphenylamine-benzophenone system).

(ii) Determination of glass transition temperature of a given salt (e.g $CaCl_2$) conductometrically.

3. Chemical kinetics

1. Determine the specific rate constant for the acid catalyzed hydrolysis of methyl acetate by the Initial Rate Method. Study the reaction at two different temperatures and calculate the thermodynamic parameters.
2. Compare the strengths of hydrochloric acid and sulphuric acid by studying rate of hydrolysis of methyl acetate.
3. Determine the specific reaction rate of the potassium persulphate-iodide reaction by the Initial Rate Methods
4. Study the kinetics of the iodination of acetone in the presence of acid by the Initial Rate Method.
5. Determination of thermodynamic parameters of the given reaction.
6. Determination of order of reaction of the given reaction

CONDUCTOMETYERY

(i) Verify Ostwald dilution law and calculate dissociation constant of weak acid
(ii) Verify Kohlrausch's law
(iii) Determine the solubility of sparingly soluble salts and its solubility product.
(iv) Determine the equivalent conductance at infinite dilution for acetic acid by applying Kohlrausch's law of independent migration of ions.

(v) Determine the equivalent conductance, degree of dissociation and dissociation constant (K_a) of acetic acid.

(vi) Study the conductometric titration of hydrochloric acid with sodium carbonate and determine the concentration of sodium carbonate in a commercial sample of soda ash.

Computational Methods

Familiarity with word processing, power point, electronic spreadsheets, data processing,mathematical packages, chemical structure drawing and molecular modelling.

(Note. Any other experiment may be introduced)