M.Sc. I Laboratory courses **First semesters**

540 rs(18Hrs/week)

INORGANIC CHEMISTRY **Marks: 80**

Qualitative analysis

a. Qualitative analysis of inorganic mixture of 8 radicals containing not more than two of the following less common metals: Tl, Mo, W, Zr, Th, V, U.
b. Insoluble – oxides, sulfates and halides.

Chromatography

Separation of cations and anions by

a. Paper chromatography
b. Column chromatography- Ion exchange.

ORGANIC CHEMISTRY

Qualitative analysis

Separation , Purification and identification of compound of two component mixture using the and column chromatography, chemical tests. IR spectra to be used for functional group identification.

Quantitative analysis

Determination of percentage or number of hydroxyl group in an organic compound by acetylation method.

Estimation of amines/phenols using bromate bromide solution/or acetylation method.

Determination of iodine and saponification value of an oil sample.

Determination of DO, COD and BDO of water sample.

PHYSICAL CHEMISTRY

Error and statistical data analysis

1. Calibration of fractional weights.
2. Calibration of volumetric apparatus-burette, pipette and standard flask.

Conductance measurement

3. Determine the cell constant of a given conductivity cell at a given temp.
4. Determine the equivalent conductance of a strong electrolyte at several concentration at a given temperature and test the validity if Onseger's equation .

Electrochemistry (EMF –Measurements) - Potentiometry / pH-metry

5. Determine the EMF of Daniel Cell.

$Zn/ZnSO_4$ (C_1) 11 $CuSO_4/CU^+$

By potentiometer taking C1 and C2 (i) same concentration (ii) Different concentration and hence to see the effect of dilution

6. Determine the solubility of a sparingly soluble salt in water by EMF method.

7. Determination of the strength of strong and week acid in a given mixture by using pH –meter.

Chemical kinetics

8. Determination of the rate constant and order of reaction for the hydrolysis of the methyl acetate catalyzed by an acid at different ionic strengths at a given temp.
9. Determine the rate constant of hydrolysis of an ester in m iceller media at a given temperature.

Cryoscopy

10. Determination of apparent molecular weight of an electrolyte in water and hence calculate the Vant Hoff factor and degree of dissociation of the electrolytes by cryoscopic method.
11. Determination of degree of dissociation / hydrolysis of weak electrolyte by cryoscopic method.

Adsorption

12. To study the adsorption of oxalic acid on activated charcoal and test the validity of Freundlich/ Langmuir adsorption isotherm.

Partition coefficient

13. To study the distribution of I_2 betweenCCl_4 and calculate the partition coefficient .
14. Determination of the partition coefficient of benzoic acid between water and benzene and comment on the molecular stat of benzoic acid in benzene.