

**MJD Govt. College Taranagar (Churu)**  
**Department of Chemistry**  
**B.Sc.-III (Syllabus)**  
**PRACTICAL EXAM**

**INORGANIC CHEMISTRY**

**A. Instrumentation**

**(i) Colorimetry**

- (a) To determine Metal- Ligand ratio of complexes by Jobs method
- (b) To determine Metal- Ligand ratio of complexes by Mole Ratio method
- (c) Determination of adulteration in Food Stuffs.  
MGSU BIKANER [155]
- (d) Effluent or waste water analysis.
- (e) Ground Water Analysis.

**(ii) Solvent Extraction:** Separation and estimation of Mg(II) and Fe(II) ions.

**(iii) Exchange Method:** Separation and estimation Mg(II) and Zn(II) ions.

**B. Synthesis & Analysis**

**(i) Inorganic Synthesis**

- (a) Sodium trioxalato ferrate (III),  $\text{Na}_3 [\text{Fe}(\text{C}_2\text{O}_4)_3]$
- (b) Ni-DMG complex,  $[\text{Ni}(\text{DMG})_2]$
- (c) Copper tetrammine complex  $[\text{Cu}(\text{NH}_3)_4] \text{SO}_4$ .
- (d) Cis-and trans-bisoxalato diaqua chromate (III) ion.

**(ii) Analysis**

Semi micro and Macro analysis , Separation and Identification of Six radicals - three acidic and three basic from a mixture with one interfering radicals and/or combinations of radicals.

**ORGANIC CHEMISTRY**

**(i) Laboratory Techniques**

- (a) Steam Distillation
- (b) Naphthalene from its suspension in water
- (c) Clove Oil form Cloves
- (d) Separation of o-and p-nitrophenols
- (e) Column Chromatography
- (f) Separation of fluorescene and methylene blue
- (g) Separation of leaf pigments form spinach leaves

(h) Resolution of racemic mixture of (+) mandelic acid

**(ii) Stereochemical Study of Organic Compounds via Models**

(a) R and S configuration of optical isomers.

(b) E and Z configuration of geometrical isomers.

(c) Conformational analysis of cyclohexanes and substituted cyclohexanes.

**(iii) Determination of following parameters of oils & fats**

(a) Saponification Value

(b) Iodine Value and /or

(c) R.M. Value

**(iv) Green Chemistry Synthesis** – Solventless synthesis of aldol derivative or any other compound

### PHYSICAL CHEMISTRY

1. To determine the strength of the given acid conductometrically using standard alkali solution.
2. To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically.
3. To study the saponification of ethyl acetate conductometrically.
4. To determine the ionisation constant of a weak acid conductometrically.
5. To titrate potentiometrically the given ferrous ammonium sulphate solution using  $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$  as titrant calculate the redox potential of  $\text{Fe}^{++}/\text{Fe}^{+++}$  system on the hydrogen scale.
6. To verify law of refraction of mixtures (e.g. of glycerol and water) using Abbe's refractometer.
7. To determine the specific rotation of a given optically active compound.
8. Determination of molecular weight of a non-volatile solute by Rast method/Backmann freezing point method.
9. Determination of the apparent degree of dissociation of an electrolyte (e.g- Na Cl) in aqueous solution at different concentrations by ebullioscopy.
10. To verify Beer-Lambert law for  $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$  and determine the concentration of the given solution of the substance.

*Suggested Books :*

1. Vogel's Qualitative Inorganic Analysis, revised, Svehla, Orient Longman.
2. Vogel's Textbook of quantitative Inorganic Analysis (revised), J. Bassett, R.C. Denney, G.H. Heffery and J Mendham, ELBS.
3. Standard Methods of Chemical Analysis, W.W. Scott, The Technical Press.
4. Experimental inorganic Chemistry, W.G. Palmer, Cambridge.
5. Handbook of Preparative Inorganic Chemistry, Vol, I & II Brauer, Academic Press.

6. Inorganic Synthesis, McGraw Hill.
7. Experimental Organic Chemistry Vol. I&II, P.R.Singh, D.S.Gupta and K.S. Bajpai, Tata McGraw Hill.
8. Laboratory Manual in Organic Chemistry, R.K. Babsal, Wiley Eastern.
9. Vogel's Textbook of Practical Organic Chemistry, B.S. Fumiss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
10. Experiments in General Chemistry, C.N.R; and U.C. Agarwal, East-West press.
11. Experiments in Physical Chemistry, R.C. Das and B. Behra, Tata McGraw hill.
12. Advanced Practical Physical Chemistry, Vol. I-Physical, J.B. Yadav, Goel Publishing House.
13. Advanced Experimental Chemistry, Vol. I-Physical, J.N. Gurju and R. Kapoor, S Chand & Co.
14. Selected Experiments in Physical Chemistry, N.G. Mukherjee. J.N. Ghose & Sons.
15. Experiments in Physical Chemistry, J.C. Ghosh, Bharati Bhavan.

#### **SCHEME OF EXAMINATION (B.Sc. Part-III) PRACTICAL**

**Max. Marks: 65 Min. Marks:- 24 Time: 5 hours**

#### **INORGANIC CHEMISTRY**

1. Instrumentation: Any one exercise – 8 Marks
2. Synthesis & Analysis: Any one exercise 7 Marks

#### **ORGANIC CHEMISTRY**

Any Two exercises taking not more than one from (i) to (iv) 5+10Marks 15 marks

#### **PHYSICAL CHEMISTRY**

Any One experiment 15 marks  
Seminar/Project 10 marks

**VIVA 05 Marks**

**RECORD 05 Marks**

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