AHILYA VISHWAVIDYALAYA, INDORE

M. Sc. CHEMISTRY PRACTICALS (SEMESTER – III)

examination shall be conducted separately for each branch : (Duration : 6-8 hrs in branch).

Inorganic Chemistry

Quantitative determination of a three component mixture	12
Chromatographic separations	12
Record	04
Viva-Voce	05
Total :	33

Quantitative determination of a three component mixture :
One Volumetrically & two gravimetrically

a. Cu^{2+}, Ni^{2+}, Zn^{2+}

b. Ag^{1+}, Ni^{2+}, Mg^{2+}

Chromatographic separations & determination of R_f values :
(Thin layer / Paper / Column chromatography)

(i) Group II metal ions.

(ii) Indicators.

(iii) Cu^{2+}, Fe^{2+}, Ni^{2+} & Co^{2+}.

(iv) Ink pigment.

Organic Chemistry

Multi - Step Synthesis of Organic compounds	12
Quantitative Estimations	12
Record	04
Viva-Voce	05
Total :	33

Multi – Step Synthesis of Organic compounds :
Exercise should illustrate the use of organic reagents & may involve purification of the products by chromatographic techniques :
Aniline → *p* – Nitroaniline; Aniline → *p* – Bromoaniline; Phthalic acid → Anthranilic acid; Pinacol -Pinacolone rearrangement (Benzophenone → Benzopinacol → Benzopincolone); Bezoin Benzilic acid (Bezoin → Benzil → Benzilic acid); Benzidine rearrangement (Hydrazobenzene → Benzidine).

Quantitative Estimations (Titrimetric method) :
(1) Estimation of glucose, glycine & ascorbic acid from Vitamin – C tablet.
(2) Determination of DO, COD & BOD of water sample.

Physical Chemistry

Any **one** Experiment / Exercise from **Section – A**		12
Any **one** Experiment / Exercise from **Section – B**		13
Record		04
Viva Voce		05
	Total :	34

Section – A

Spectroscopy

1. **(a)** Interpretation of IR, NMR spectra.
   (b) Numerical problems on UV, IR & NMR.

2. **Spectrophotometry / Colorimetry**

(a) Determination of the composition of a mixture of $K_2Cr_2O_7$ & $KMnO_4$ by the application of mixture law.

(b) Determination of Phosphate concentration in a soft drink.

(c) Titration of Mohr's salt with $K_2Cr_2O_7$ / $KMnO_4$ solution.

(d) Determination of order & energy of activation for the decomposition of violet colour complex formed between ceric ions & N – Phenyl anthranilic acid.

Chemical Kinetics

1. Determination of kinetics of decomposition of complex formed between sodium sulphide & sodium nitroprusside spectrophotometrically.
2. Investigate the reaction between acetone & iodine.

Section – B

Electronics :

1. Study of the charge & discharge of a capacitor through a resistor.
2. Verification of Kirchoff's current law (KCL) & Kirchoff's voltage law (KVL).

Conductometry :

1. Determination of equivalent conductance of a weak electrolyte at different concentrations, and hence the dissociation constant of the electrolyte. Also verify Ostwald's dilution law.
2. Determination of equivalent conductance of a weak electrolyte at infinite dilution using Kohlrausch law.

pH metry:

1. Determination of Acidic and Basic dissociation constant of an amino acid and Isoelectric point of the acid.
2. Measurement of the pH of Buffer Solution ($CH_3COOH + CH_3COONa$) using Henderson's equation and hence pK_a.

Books Suggested:

1. Inorganic Experimens, J. Derek Woolings, VCH.
2. Microscale Inorganic Chemistry, Z. Szafran, R.M, Pike and M.M. Singh, Wiley.
3. Practical Inorganic Chemistry, G. Marr and B. W. Rockett, Van Nostrad.
4. The systematic Identification of Organic Compounds, R.L. Shriner and D.Y. Curlin.