S.B.V.P.Samaj's

Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester : Ist Class :F.Y.BSc Subject : Physical & Inorganic Chemistry

Month & Year	Title of the Topic	No. of Lectures
June 2013	**Admission Process**	--------
July 2013	**Chapter 1: States of Matter** **Introduction:** States of matter and their properties. **Gaseous states**: Significance of ideal and kinetic gas equation (no derivation), Real gases- Compressibility factor, van der Waal's equation of state, Isotherms of CO_2, critical constants, correlation between critical constants and van der Waal's constants. **Liquid state** – Properties of liquids , Comparison between gaseous and solid state – Experimental determination of vapor pressure by isoteniscopic method and viscosity by Ostwald method, liquid crystals and their applications.	09
August 2013	**Chapter 2: Surface Chemistry** **Adsorption**: Types of adsorption, adsorption isotherms, Freundluich isotherm, Langmuir isotherm, adsorption of gases on solids, adsorption of solutes on solids, applications of adsorption, **Catalysis** : Phenomena of catalysis, types of catalysis- homogeneous and heterogeneous catalysis, gaseous reactions on solid surfaces. **Colloids**: Definition and classification, preparation of emulsions, gels and sols, properties of suspensoids.	16
September 2013	**Chapter 3: Chemical Mathematics** **Functions and variables:** Variables as function , variables used in chemistry **Derivative**: Rules of differentiation, examples on derivatives of algebraic, logarithmic and exponential functions, partial differentiation, conditions for maxima and minima, problems related to chemistry, 11 **Integration**: Rules of integration (algebraic, exponential and logarithmic functions), Integration –definite and indefinite, problems related to chemistry. **Graph**: Plotting graphs of linear, exponential and logarithmic functions and their characteristics, sketching of s and p orbitals.	16

October 2013	**Chapter 4: Mole Concept and Oxidation-reduction** Mole concept-Determination of mol. Weight by gram molecular volume relationship, problems based on mole concept. Methods of expressing concentrations, strength, normality, molarity, molality, %w/v, %v/v, ppm, standardization of solutions, primary & secondary standard substances, Preparation of standard solution of acids & bases, problems related to acid base titrations only. Oxidation & reduction-Definitions to related terms like oxidation, reduction, oxidizing agent, reducing agent, oxidation number, Balancing of redox reactions using oxidation number method & ion electron method, problems based one equivalent weight of oxidant & reductants	10
	TERM --II	
November2013	**Atomic Structure** Introduction, atomic spectrum of hydrogen, Bohr model of hydrogen atom-derivation of atomic radius and energy, energy level diagram of hydrogen atom , Failure of Classical mechanics- black body radiation, photoelectric effect, electron diffraction, atomic spectra,	12
Decmber 2013	**Atomic Structure** quantization of energy, de Broglie's hypothesis, Heisenberg's uncertainty principle (without proof), wave equation, time independent Schrödinger equation, hydrogen atom (expressions only)., wave functions for s and p atomic orbitals, **Chapter 5: Chemical Thermodynamics** Introduction, first law of thermodynamics and its limitations, Carnot cycle and efficiency, Entropy and second law of thermodynamics, entropy as a state function, Entropy change in isolated system, reversible and irreversible process, entropy change in ideal gases –	12
January 2014	**Chemical Thermodynamics** isothermal , isobaric , isochoric processes , entropy change in physical transitions , entropy change in chemical reactions, statistical definition of entropy, absolute entropy, third law of thermodynamics **Chemical bonding** Attainment of stable configuration, Types of bonds ionic, covalent, co-ordinate & metallic, Types of overlaps: s-s, p-p, s-p, p-d, d-d and their examples, Formation of sigma & pi bonds, Theories of bonding- a)valance bond theory, b) Heitler London theory and c) Pauling Slater theory, Concept of hybridization: Definition & need of hybridization, steps involved in hybridization	12

February2014	**Chemical bonding** explanation of covalency of atoms in the moles based on hybridization, types of hybridization involving s, p, & d orbitals. Applications of hybridization geometries of molecules like i) BeH_2 ii) BF_3 iii) $[MnCl_4]^{2-}$ iv) $[Ni(CN)_4]^{2-}$ v) $Fe(CO)_5$ vi) $[Cr(H_2O)_6]^{2+}$ vii) IF_7 VSEPR theory: Assumptions, need of theory, application of theory to explain geometry of irregular molecules i) ClF_3 ii) Cl_2O iii) BrF_5 iii) $TeCl_4$ iv) XeO_3 v) $XeOF_4$	12
March 2014	**Practical & Theory Examination**	

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S.B.V.P.Samaj's

SahakarMaharshiBhausahebSantujiThorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester : I/II Class : F.Y.BSc Subject :Organic and Inorganic Chemistry

Month & Year	Title of the Topic	No. of Lectures
June 2013	**Admission Process**	--------
July 2013	**Chapter1: Chemical Bonding, structure and reactivity of Organic Molecules** Covalent bond, Hybridization - sp, sp^2 and sp^3 hybridization, Bond length, Bond angle, Bond energy, Inter and Intra molecular forces and their effects, Drawing organic molecules, zig-zag structures, Lewis structure and formal charge, Arrow pushing concept, Structural effects - Inductive effect, Steric effect, Resonance effect, Hyper-conjugation, Tautomerism, Applications of structural effects - Strength of acids and bases, pKa and pK values of common organic acids and bases.	09
August 2013	**Chapter1: Chemical Bonding, structure and reactivity of Organic Molecules** Inductive effect, Steric effect, Resonance effect, Hyper-conjugation, Tautomerism, Applications of structural effects - Strength of acids and bases, pKa and pK values of common organic acids and bases. **Chapter 2: Chemistry of Hydrocarbons** Introduction, Nomenclature, Physical properties, General methods for preparation, Chemical reactions of-Alkanes, alkenes , alkynes and introduction to homocyclic and polycyclic	09
September2013	**Chapter 2: Chemistry of Hydrocarbons** aromatic hydrocarbons (benzene, naphthalene, anthracty. Huckel's rule of aromaticity.Huckelity.	09
October 2014	**Chapter 3: Chemistry of s-block Elements** Recapitulation of periodic table, special position of hydrogen in the long form of the periodic table, properties of s-block elements w.r.t. electronic configuration, extraction, trends and properties, Introduction to crown ethers and cryptans, separation of s-block elements using crown ethers, Compounds of s-block elements: oxides, hydroxides, peroxides, superoxides, Application of s-block elements in industrial, biological and	09

	agricultural fields. reductants	
	TERM --II	
November2013	**Chapter 4: Chemistry of functional groups** Introduction, Nomenclature, Physical properties, General methods for preparation, Chemical reactions of: Alkyl halides, alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids, amines.	09
Decmber 2013	**Chapter 5:Stereochemistry** Concept of isomerism, types of isomers, representation of organic molecules (Projection formulae), conformational isomerism in alkanes (Ethane, propane and n-butane) with energy profile diagrams, Geometrical isomerism - Definition, conditions for geometrical isomers, physical and chemical properties, E/Z nomenclature of geometrical isomers, Optical isomers – Isomer number and tetrahedral carbon atom, chirality, optical isomerism with one asymmetric carbon atom, specific rotation, enantiomerism, R/S nomenclature	09
January 2014	**Chapter 5:Stereochemistry** physical and chemical properties, E/Z nomenclature of geometrical isomers, Optical isomers – Isomer number and tetrahedral carbon atom, chirality, optical isomerism with one asymmetric carbon atom, specific rotation, enantiomerism, R/S nomenclature.	09
February2014	**Chapter 6: Chemistry of p-block elements** Position of elements in periodic table, electronic configuration of elements trends in properties like atomic size, ionization potential, electronegativity, electron affinity, reactivity, oxidation states, anamolousbehaviuor of first member of each group	09
Mar 2014	**Exam**	--

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : F.Y.BSc Subject :Chemistry Batch No :I

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine the gas constant R in different units by eudiometer method. To determine relative viscosity of given organic liquids by viscometer. (four liquids)	3 Hrs 3 Hrs
August 2013	3,4,5,6	Investigate the adsorption of acetic acid by activated charcoal and test the validity of Freundlich /Langmuir adsorption isotherm. To determine ΔH and ΔS for the following chemical reactions Determination of hardness of water from a given sample of water by EDTA method. To standardize NaOH solution & hence find the strength of given HCl solution.	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	To standardize KMnO4 soln. & hence find strength of the given solution Crystallization with M.P. and % yield of purified compound Distillation with B.P. and % yield of purified compound Sublimation with M.P. and % yield of purified compound	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Organic qualitative analysis of single organic compound at least one belonging from each type Type, Preliminary tests, elements, functional group, physical constants Compound No 1: Benzoic acid Compound No 2: Salicylic acid	3 Hrs 3 Hrs
December 2013	13,14,15,16	Compound No 3: Aniline Compound No 4: ethyl acetate Compound No 5:oxalic acid Compound No 6: β-Naphthol,	3 Hrs 3 Hrs 3 Hrs 3 Hrs

January 2014	17,18	Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	19,20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 Inorganic qualitative analysis mixture -6 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Dr.Borhade S.S.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : F.Y.BSc Subject :Chemistry Batch No :II

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine the gas constant R in different units by eudiometer method. To determine relative viscosity of given organic liquids by viscometer. (four liquids)	3 Hrs 3 Hrs
August 2013	3,4,5,6	Investigate the adsorption of acetic acid by activated charcoal and test the validity of Freundlich /Langmuir adsorption isotherm. To determine ΔH and ΔS for the following chemical reactions Determination of hardness of water from a given sample of water by EDTA method. To standardize NaOH solution & hence find the strength of given HCl solution.	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	To standardize KMnO4 soln. & hence find strength of the given solution Crystallization with M.P. and % yield of purified compound Distillation with B.P. and % yield of purified compound Sublimation with M.P. and % yield of purified compound	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Organic qualitative analysis of single organic compound at least one belonging from each type Type, Preliminary tests, elements, functional group, physical constants Compound No 1: Benzoic acid Compound No 2: Salicylic acid	3 Hrs 3 Hrs
December 2013	13,14,15,16	Compound No 3: Aniline Compound No 4: ethyl acetate Compound No 5:oxalic acid Compound No 6: β-Naphthol,	3 Hrs 3 Hrs 3 Hrs 3 Hrs

January 2014	17,18	Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	19,20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 Inorganic qualitative analysis mixture -6 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Dr.Borhade S.S.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : F.Y.BSc Subject :Chemistry Batch No :III

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine the gas constant R in different units by eudiometer method. To determine relative viscosity of given organic liquids by viscometer. (four liquids)	3 Hrs 3 Hrs
August 2013	3,4,5,6	Investigate the adsorption of acetic acid by activated charcoal and test the validity of Freundlich /Langmuir adsorption isotherm. To determine ΔH and ΔS for the following chemical reactions Determination of hardness of water from a given sample of water by EDTA method. To standardize NaOH solution & hence find the strength of given HCl solution.	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	To standardize KMnO4 soln. & hence find strength of the given solution Crystallization with M.P. and % yield of purified compound Distillation with B.P. and % yield of purified compound Sublimation with M.P. and % yield of purified compound	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Organic qualitative analysis of single organic compound at least one belonging from each type Type, Preliminary tests, elements, functional group, physical constants Compound No 1: Benzoic acid Compound No 2: Salicylic acid	3 Hrs 3 Hrs
December 2013	13,14,15,16	Compound No 3: Aniline Compound No 4: ethyl acetate Compound No 5:oxalic acid Compound No 6: β-Naphthol,	3 Hrs 3 Hrs 3 Hrs 3 Hrs

January 2014	17,18	Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	19,20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 Inorganic qualitative analysis mixture -6 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Pawar D.C.
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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : F.Y.BSc Subject :Chemistry Batch No :IV

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine the gas constant R in different units by eudiometer method. To determine relative viscosity of given organic liquids by viscometer. (four liquids)	3 Hrs 3 Hrs
August 2013	3,4,5,6	Investigate the adsorption of acetic acid by activated charcoal and test the validity of Freundlich /Langmuir adsorption isotherm. To determine ΔH and ΔS for the following chemical reactions Determination of hardness of water from a given sample of water by EDTA method. To standardize NaOH solution & hence find the strength of given HCl solution.	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	To standardize KMnO4 soln. & hence find strength of the given solution Crystallization with M.P. and % yield of purified compound Distillation with B.P. and % yield of purified compound Sublimation with M.P. and % yield of purified compound	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Organic qualitative analysis of single organic compound at least one belonging from each type Type, Preliminary tests, elements, functional group, physical constants Compound No 1: Benzoic acid Compound No 2: Salicylic acid	3 Hrs 3 Hrs
December 2013	13,14,15,16	Compound No 3: Aniline Compound No 4: ethyl acetate Compound No 5:oxalic acid Compound No 6: β-Naphthol,	3 Hrs 3 Hrs 3 Hrs 3 Hrs

January 2014	17,18	Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	19,20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 Inorganic qualitative analysis mixture -6 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Pawar D.C.
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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : F.Y.BSc Subject :Chemistry Batch No :V

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine the gas constant R in different units by eudiometer method. To determine relative viscosity of given organic liquids by viscometer. (four liquids)	3 Hrs 3 Hrs
August 2013	3,4,5,6	Investigate the adsorption of acetic acid by activated charcoal and test the validity of Freundlich /Langmuir adsorption isotherm. To determine ΔH and ΔS for the following chemical reactions Determination of hardness of water from a given sample of water by EDTA method. To standardize NaOH solution & hence find the strength of given HCl solution.	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	To standardize KMnO4 soln. & hence find strength of the given solution Crystallization with M.P. and % yield of purified compound Distillation with B.P. and % yield of purified compound Sublimation with M.P. and % yield of purified compound	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Organic qualitative analysis of single organic compound at least one belonging from each type Type, Preliminary tests, elements, functional group, physical constants Compound No 1: Benzoic acid Compound No 2: Salicylic acid	3 Hrs 3 Hrs
December 2013	13,14,15,16	Compound No 3: Aniline Compound No 4: ethyl acetate Compound No 5:oxalic acid Compound No 6: β-Naphthol,	3 Hrs 3 Hrs 3 Hrs 3 Hrs

January 2014	17,18	Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	19,20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 Inorganic qualitative analysis mixture -6 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Surve S.B.
Sign. of the Subject Teacher **Sign of Head of Department**

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : F.Y.BSc Subject :Chemistry Batch No :VI

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine the gas constant R in different units by eudiometer method. To determine relative viscosity of given organic liquids by viscometer. (four liquids)	3 Hrs 3 Hrs
August 2013	3,4,5,6	Investigate the adsorption of acetic acid by activated charcoal and test the validity of Freundlich /Langmuir adsorption isotherm. To determine ΔH and ΔS for the following chemical reactions Determination of hardness of water from a given sample of water by EDTA method. To standardize NaOH solution & hence find the strength of given HCl solution.	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	To standardize KMnO4 soln. & hence find strength of the given solution Crystallization with M.P. and % yield of purified compound Distillation with B.P. and % yield of purified compound Sublimation with M.P. and % yield of purified compound	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Organic qualitative analysis of single organic compound at least one belonging from each type Type, Preliminary tests, elements, functional group, physical constants Compound No 1: Benzoic acid Compound No 2: Salicylic acid	3 Hrs 3 Hrs
December 2013	13,14,15,16	Compound No 3: Aniline Compound No 4: ethyl acetate Compound No 5:oxalic acid Compound No 6: β-Naphthol,	3 Hrs 3 Hrs 3 Hrs 3 Hrs

January 2014	17,18	Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	19,20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 Inorganic qualitative analysis mixture -6 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Surve S.B.
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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : F.Y.BSc Subject :Chemistry Batch No :VII

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine the gas constant R in different units by eudiometer method. To determine relative viscosity of given organic liquids by viscometer. (four liquids)	3 Hrs 3 Hrs
August 2013	3,4,5,6	Investigate the adsorption of acetic acid by activated charcoal and test the validity of Freundlich /Langmuir adsorption isotherm. To determine ΔH and ΔS for the following chemical reactions Determination of hardness of water from a given sample of water by EDTA method. To standardize NaOH solution & hence find the strength of given HCl solution.	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	To standardize KMnO4 soln. & hence find strength of the given solution Crystallization with M.P. and % yield of purified compound Distillation with B.P. and % yield of purified compound Sublimation with M.P. and % yield of purified compound	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Organic qualitative analysis of single organic compound at least one belonging from each type Type, Preliminary tests, elements, functional group, physical constants Compound No 1: Benzoic acid Compound No 2: Salicylic acid	3 Hrs 3 Hrs
December 2013	13,14,15,16	Compound No 3: Aniline Compound No 4: ethyl acetate Compound No 5:oxalic acid Compound No 6: β-Naphthol,	3 Hrs 3 Hrs 3 Hrs 3 Hrs

January 2014	17,18	Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	19,20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 Inorganic qualitative analysis mixture -6 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Dr.Borhade S.S.
Sign. of the Subject Teacher **Sign of Head of Department**

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : F.Y.BSc Subject :Chemistry Batch No :VIII

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine the gas constant R in different units by eudiometer method. To determine relative viscosity of given organic liquids by viscometer. (four liquids)	3 Hrs 3 Hrs
August 2013	3,4,5,6	Investigate the adsorption of acetic acid by activated charcoal and test the validity of Freundlich /Langmuir adsorption isotherm. To determine ΔH and ΔS for the following chemical reactions Determination of hardness of water from a given sample of water by EDTA method. To standardize NaOH solution & hence find the strength of given HCl solution.	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	To standardize KMnO4 soln. & hence find strength of the given solution Crystallization with M.P. and % yield of purified compound Distillation with B.P. and % yield of purified compound Sublimation with M.P. and % yield of purified compound	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Organic qualitative analysis of single organic compound at least one belonging from each type Type, Preliminary tests, elements, functional group, physical constants Compound No 1: Benzoic acid Compound No 2: Salicylic acid	3 Hrs 3 Hrs
December 2013	13,14,15,16	Compound No 3: Aniline Compound No 4: ethyl acetate Compound No 5:oxalic acid Compound No 6: β-Naphthol,	3 Hrs 3 Hrs 3 Hrs 3 Hrs

January 2014	17,18	Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	19,20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 Inorganic qualitative analysis mixture -6 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Dr.Dandwate S.C.
Sign. of the Subject Teacher **Sign of Head of Department**

S.B.V.P.Samaj's

Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : F.Y.BSc Subject :Chemistry Batch No :IX

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine the gas constant R in different units by eudiometer method. To determine relative viscosity of given organic liquids by viscometer. (four liquids)	3 Hrs 3 Hrs
August 2013	3,4,5,6	Investigate the adsorption of acetic acid by activated charcoal and test the validity of Freundlich /Langmuir adsorption isotherm. To determine ΔH and ΔS for the following chemical reactions Determination of hardness of water from a given sample of water by EDTA method. To standardize NaOH solution & hence find the strength of given HCl solution.	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	To standardize KMnO4 soln. & hence find strength of the given solution Crystallization with M.P. and % yield of purified compound Distillation with B.P. and % yield of purified compound Sublimation with M.P. and % yield of purified compound	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Organic qualitative analysis of single organic compound at least one belonging from each type Type, Preliminary tests, elements, functional group, physical constants Compound No 1: Benzoic acid Compound No 2: Salicylic acid	3 Hrs 3 Hrs
December 2013	13,14,15,16	Compound No 3: Aniline Compound No 4: ethyl acetate Compound No 5:oxalic acid Compound No 6: β-Naphthol,	3 Hrs 3 Hrs 3 Hrs 3 Hrs

January 2014	17,18	Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	19,20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 Inorganic qualitative analysis mixture -6 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Dr.Borhade S.S. + Prof.Gavande M.J.
Sign. of the Subject Teacher **Sign of Head of Department**

S.B.V.P.Samaj's

SahakarMaharshiBhausahebSantujiThorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester: ISTIInd/III&IV Class : S.Y.BSc Subject : Physical and Analytical Chemistry

Month & Year	Title of the Topic	No. of Lectures
June 2013	**Admission Process**	--------
July 2013	**Chapter 1: Elementary Chemical Kinetics** Introduction to Chemical kinetics, molecularity and order of reaction , reaction rates, rate laws, rate constant and its significance, Integrated rate law expression and its characteristics–first order, second order (single reactant, two reactants involved), examples of 1st and 2nd order reaction, pseudomolecular reactions, factors affecting rate of reaction, measurement of rate of reaction, numericals. **Chapter 4: Introduction to Analytical Chemistry** Introduction, Chemical analysis, applications of chemical analysis, sampling, types of analysis, Common techniques, Instrumental methods, other techniques, factors affecting on choice of method	12
August 2013	**Chapter 2: Photochemistry** Introduction, thermal reactions and photochemical reactions, laws of photochemistry, quantum yield, measurement of quantum yield, types of photochemical reactions- photosynthesis, photolysis, photocatalysis, photosensitization, photophysical process– fluorescence, phosphorescence, quenching, chemiluminiscence, numericals. **Chapter 3: Distribution law** Nernst distribution law, Statement and thermodynamic proof for Nernst distribution law, association and dissociation of solute in solvent, application of distribution law, Numericals.	12
September2013	**Chapter 5: Errors in Quantitative Analysis** Introduction, Error, Accuracy, precision, methods of expressing accuracy and precision, classification of errors, significant figures and computations, distribution of random errors, mean and standard deviations, reliability of results, Numericals.	12

	Chapter 6: Inorganic Qualitative Analysis Basic principle, common ion effect, solubility, solubility product, preparation of original solution, classification of basic radicals in groups,	
October 2013	. separation of basic radicals, removal of interfering anions (phosphate and borate), detection of acid radicals. **Chapter 7: Analysis of Organic Compounds (Qualitative & Quantitative)** **I. Qualitative** A. Types of organic compounds, Characteristic tests and classifications, reactions of different functional groups, analysis of binary mixtures. **II Quantitative** B. Analysis–estimation of C, H, (O) by combustion tube, detection of nitrogen, sulfur, halogen and phosphorous by Lassigen's test. C. Estimation of nitrogen by Dumas's Kjeldahl's method, estimation of halogen, sulphur and phosphate by Carious method. D. Determination of empirical and molecular formula, numerical problems.	12
	TERM-II	
Nov 2013	**Diwali vacation**	--------
Nov 2013	**Chapter 3: Introduction to Volumetric Analysis:** Introduction, methods of expressing the conc. primary and secondary standard solutions apparatus used and their, calibration, burettes, microburettes, volumetric pipettes, graduated pipettes, volumetric flask, method of calibration, Instrumental and non-instrumental analysis-principles and types.	06
Dec 2013	**Chapter 4: Non Instrumental Volumetric Analysis:** Indicators –Theory of indicators, acid base indicators, Mixed and universal indicators Acid-base titrations : Strong acid-strong base, weak acid – strong base, weak acid-weak base titration, displacement titrations ,polybasic acid titrations (Discuss titration with respective neutralization and equivalence point determination and limitations)	18
Jan 2014	Redox titrations: Principal of redox titration ,detection of equivalence point by using suitable indicators Complexometric titration: Principal, EDTA titrations, Choice of indicators Iodometry and Iodimetry : Principle , detection of end point, difference between iodometry and iodimetry , standardization of sodium thiosulphate solution using potassium dichromate and iodine method , applications – estimation of Cu, estimation of Cl_2	

Feb 2014	**Chapter 1: Free Energy and Equilibrium:** Introduction, Helmholtz free energy ,Variation of Helmholtz free energy with volume and temperature , Helmholtz free energy change for chemical reaction , Gibbs free energy ,variation of Gibbs free energy with pressure & temp. Gibbs free energy change for chemical reaction , Free energy change for physical transitions, free energy change for ideal gas, standard free energy change, Gibbs - Helmholtz equation ,Properties & significance of Gibbs free energy change, Vant Hoff 's reaction isotherm , thermodynamics equilibrium constants .Relation between Kp & Kc for gaseous reaction ,Variation of equilibrium constant with temp., criteria of chemical equilibrium, Physical equilibrium, Clapeyron equation , Clausius - Clapeyron equation, application of Clausius --Clapeyron equation Numericals	12
March 2014	**Chapter 2 :Solutions of Liquids in Liquids:** :- Types of solution , Ideal solution, Rault's law, ideal and non ideal solutions, Henry's law, application of Henry's law with example CS2 in acetone ,problems based on Rault's law and Henry's law, Vapour pressure –composition dig. of ideal and non ideal solution, Temp. –composition dig. of miscible binary solution, Distillation from temp.- composition dig. Azeotropes, partially miscible liquids,	12
April 2014	Exam	

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S.B.V.P.Samaj's

SahakarMaharshiBhausahebSantujiThorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester : Ist Class :S.Y.BSc Subject :Inorganic Chemistry

Month & Year	Title of the Topic	No. of Lectures
June 2013	**Admission Process** **General Princi[ple of Metallurgy**– Mineral, Ore ,Types of Ore ,Type of Concentration of Ore	04
July 2013	Calcination & Roasting ,Refining, Types of Refining **Metallurgy of Aluminium (ElectroMetallurgy)** – Physicochmical principle ,Extraction,Electrolysis of Alumina ,Refning of Aluminium,Uses of Aluminium	08
August 2013	**Metallurgy of Iron & Steel (Pyro Metallurgy)** – Ores of Iron ,Commercial Form of iron ,manufacture of pig or Cast iron by Blast Farnace Method, Physico - chemical principle, manufacture of wrought iron by PuddlingProcess ,Steel-manufacture of Steel From pig or Cast iron.	09
September 2013	manufacture of Steel by Bessemer process, Acidic Bessemer & Basic Bessemer process, L.D.Process Advantages of L.D.Process,Heat treatment . **Corrosion & Passivity** - Def^{n}, Types of Corrosion, Theories of Corrosion, factor affecting the Corrosion, other types Of Corrosion, Method of Preventation of Corrosion	08
October 2013	Passivity – Def^{n}, Theories of Passivity, Gaseous film Theory, Oxide film Theory, Electrochemical Passivity **Diwali Holidays**	04
	TERM-II	
Nov 2013	**Introduction to d-block element**	02
Dec 2013	**Chemistry of d-block elements** Position of d-block in periodic table, electronic configuration, trends in properties of these elements w.r.t.(a) size of atoms & ions (b) reactivity (c) catalytic activity (d) oxidation state (e) complex formation ability (f) colour (g) magnetic properties (h) non-stoichiometry (i) density, melting & boiling points. **Acids, Bases and Solvents** Definition of acids and bases, Arrhenius theory, Lowry-Bronsted theory, Lewis concept, Lux-Flood theory. strength of acids and bases, trends in the strength of hydracids and oxyacids, Properties of solvents, M.P-B.P range, dipole moment, dielectric constant, Lewis acid-base character and types of solvents.	16

Jan 2014	**Genral Principles of Metallurgy** Introduation occurrence of metals, ores and minerals, types of ores, operations involved in metallurgy, crushing, connentaion, various methods of concentration such as hand picking, gravity separation, magnetic separation. Froth flotation, Calcinations, Roasting etc. Reducation, various methods of reduction such as smelting, Aluminothermic process and electrolytic reduction, Refining of metals, various methods of refining such as poling, liquation, electrolytic and vapour phase refining. **Metallurgy of Aluminium (Electrometallurgy)** Occurrence, physiochemical principles, Extraction of Aluminium, Purification of bauxite by Bayer's process, Electrolysis of alumina, application of aluminum and its alloys. **Metallurgy of Iron and Steel (Pyrometallurgy)** Occurrence, concentration, calcination, smelting physio-chemical principles, reactions in the blast furnace, wrought iron, manufacture of steel by Bessemer and L.D. process, its composition and applications.	16
Feb 2014	**Chemistry of p-block Elements (III A to VII A groups)** Position of elements in the periodic table, electronic configuration of elements, Reasoning of anomalous behaviour of first member of each group. Trends in the properties of theelements with respect to following points - size of atoms and ions,ionisation potential, electron negativity, oxidation state, reactivity. Bonding and shapes of following molecules – B2H6, PCl5, Al2 Br6, CO2, SF6, H2SO4, Allotropes of carbon diamond, graphite and fullerene.	08
Mar 2014	**Corrosion and Passivity** **(a) Corrosion :** Definition of corrosion, Types of corrosion, Atmospheric, Immersed, Mechanism of electrochemical corrosion, Factors affecting corrosion - position of metal in E. C. S., purity effect of moisture, effect of oxygen, pH, physical state of metal, alloy formation, making metal cathodic, controlling external condition. Coating - galvanising, Tinning, electroplating, metal cladding, organic coating. **(b) Passivity :** Definition, Theories of passivity - (i) oxide film theory (ii) Gaseous film theory (iii) Physical film theory, valence theory, catalytic theory, Allotropic theory, electrochemicalpassivity. **Revision of syllabus and question paper solving** **Practical Examination**	06
Apr 2014	**Annual Examination**	

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Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester :IST& IInd Class : _S.Y.B.Sc Subject : ORGANIC CHEMISTRY

Month & Year	Title of the Topic	No. of Lectures
JUNE2013	**ADMISSION PROCESS**	-
JULY 2013	**1: Organic reaction Mechanism** Introduction, types of reagents–electrophile, nucleophile and free radical. Types of organic reactions: Addition, Elimination (β-elimination and Hofmann elimination), substitution (aliphatic electrophilic and nucleophilic, aromatic electrophilic) and rearrangement. Mechanism: (i) Aldol condensation	06
AUG 2013	(ii) Markovnikov and anti-Markovnikov addition reaction (iii) Saytzeff and Hoffmann elimination (iv) SN 1 and SN 2 reactions (v) Hofmann rearrangement 2. S**tereoisomerism** Introduction to optical isomerism: Chirality, optical activity and polarimetry,	06
SEPT 2013	enantiomers, absolute configuration, R/S system nomenclature with wedge and Fischer representation of two chiral centres, erythro, threo, meso-diastereomers with R/S configuration. Stereoisomerism Baeye's strain theory, heat of combustion, cycloalkanes, factors affecting the stability of conformation, Conformation of cyclohexane - equatorial and axial bonds, Monosubstituted cyclohexane stability with -CH3 and -C(CH3)3 substitutes. Structures of geometrical isomers of dimetylcyclohexane only.	06
0CT 2013	Conformation of cyclohexane - equatorial and axial bonds, Monosubstituted cyclohexane stability with -CH3 and -C(CH3)3 substitutes. Structures of geometrical isomers of dimetylcyclohexane only.	06
	Total chapter:02 NO. OF LECTURE:24	
	TERM-II	
NOV 2013	Chapter 1: Reagents in Organic Synthesis [8] Catalytic hydrogenation including liquid phase hydrogenation, Birch reduction, NaBH4, LiAlH4, Sn/HCl Oxidation reagents: KMnO4, K2Cr2O7,Jones reagent, PCC,	04 lec

DEC 2013	Per acids, OsO_4. Student should understand: i) Concept of different reagents used in the one type of conversion ii) Merits & demerits of different reagents iii) Reagent based mechanisms iv) Use of different hydrogen donors for hydrogenation	5lec
JAN 2014	Chapter 2: Chemistry of heterocyclic compounds with one hetero atom. [6] Definition and classification of heterocyclic compounds, nomenclature and aromatic character. Synthesis of Pyrrole, Furan, Thiophene, Pyridine and their reactions: Nitration, Sulphonation, Acylation and Catalytical reduction. Structure and synthesis of quinoline and Isoquinoline. **Chapter 3: Introduction of Bio-molecules -**Carbohydrates: Definition, classification, reaction of monosaccharide (glucose)- oxidation, reduction, osazone and ester formation, isomerization, Killiani-Fischer synthesis and Ruff degradation,	7 lec
FEB 2014	Configuration of D/L configuration of (+) Glucose, Fischer-Haworth and chair formulae, Brief account of disaccharides: Sucrose, cellobiose, maltose and lactose. Polysaccharides: Starch, cellulose and glycogen. Amino acids: Fischer projection, relative configuration, classification, structures and reactions of amino acids, Properties and chemical reactions with amino and carboxylic group. Proteins: Formation of Peptide linkage, α-helical conformation, β-plated structure, primary, secondary, tertiary and quaternary structure of proteins.	08 lec
	Total chapter: 03 No.of lecture:24	

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Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : S.Y.BSc Subject :Chemistry Batch No : I

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine critical solution temperature of phenol water system Determination of solubility of benzoic acid at different temperature and to determine H of dissociation process.	3 Hrs 3 Hrs
August 2013	3,4,5,6	To study neutralization of acid (HCL) By Base (NaOH) & CH_3COOH by NaOH & H_2SO_4 by NaOH To determine rate constant (or to study kinetics) of acid catalysed ester hydrolysis To determine rate constant (or to study kinetics) of base catalysed ester hydrolysis To determine molecular wt of given organic liquid by steam distillation	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Estimation of sodium carbonate content of washing soda To determine the strength of hydrogen peroxide Estimation of aspirin from the given tablet Preparation of phthalimide from phthalic anhydride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Preparation of dibenzylidene acetone Preparation of parabromo acetanilide	3 Hrs 3 Hrs
December 2013	13,14,15,16	Organic qualitative analysis Binary mixture -1 Organic qualitative analysis Binary mixture -2 Organic qualitative analysis Binary mixture -3 Organic qualitative analysis Binary mixture -4	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18,19	Organic qualitative analysis Binary mixture -5	3 Hrs

2014		Inorganic qualitative analysis mixture -1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Dr.Dandwate S.C.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : S.Y.BSc Subject :Chemistry Batch No : II

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine critical solution temperature of phenol water system Determination of solubility of benzoic acid at different temperature and to determine H of dissociation process.	3 Hrs 3 Hrs
August 2013	3,4,5,6	To study neutralization of acid (HCL) By Base (NaOH) & CH_3COOH by NaOH & H_2SO_4 by NaOH To determine rate constant (or to study kinetics) of acid catalysed ester hydrolysis To determine rate constant (or to study kinetics) of base catalysed ester hydrolysis To determine molecular wt of given organic liquid by steam distillation	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Estimation of sodium carbonate content of washing soda To determine the strength of hydrogen peroxide Estimation of aspirin from the given tablet Preparation of phthalimide from phthalic anhydride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Preparation of dibenzylidene acetone Preparation of parabromo acetanilide	3 Hrs 3 Hrs
December 2013	13,14,15,16	Organic qualitative analysis Binary mixture -1 Organic qualitative analysis Binary mixture -2 Organic qualitative analysis Binary mixture -3 Organic qualitative analysis Binary mixture -4	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18,19	Organic qualitative analysis Binary mixture -5	3 Hrs

2014		Inorganic qualitative analysis mixture -1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Dr.Dandwate S.C.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : S.Y.BSc Subject :Chemistry Batch No : III

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine critical solution temperature of phenol water system Determination of solubility of benzoic acid at different temperature and to determine H of dissociation process.	3 Hrs 3 Hrs
August 2013	3,4,5,6	To study neutralization of acid (HCL) By Base (NaOH) & CH_3COOH by NaOH & H_2SO_4 by NaOH To determine rate constant (or to study kinetics) of acid catalysed ester hydrolysis To determine rate constant (or to study kinetics) of base catalysed ester hydrolysis To determine molecular wt of given organic liquid by steam distillation	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Estimation of sodium carbonate content of washing soda To determine the strength of hydrogen peroxide Estimation of aspirin from the given tablet Preparation of phthalimide from phthalic anhydride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Preparation of dibenzylidene acetone Preparation of parabromo acetanilide	3 Hrs 3 Hrs
December 2013	13,14,15,16	Organic qualitative analysis Binary mixture -1 Organic qualitative analysis Binary mixture -2 Organic qualitative analysis Binary mixture -3 Organic qualitative analysis Binary mixture -4	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18,19	Organic qualitative analysis Binary mixture -5	3 Hrs

2014		Inorganic qualitative analysis mixture -1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Dr.Dandwate S.C.

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Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : S.Y.BSc Subject :Chemistry Batch No : IV

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine critical solution temperature of phenol water system Determination of solubility of benzoic acid at different temperature and to determine H of dissociation process.	3 Hrs 3 Hrs
August 2013	3,4,5,6	To study neutralization of acid (HCL) By Base (NaOH) & CH_3COOH by NaOH & H_2SO_4 by NaOH To determine rate constant (or to study kinetics) of acid catalysed ester hydrolysis To determine rate constant (or to study kinetics) of base catalysed ester hydrolysis To determine molecular wt of given organic liquid by steam distillation	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Estimation of sodium carbonate content of washing soda To determine the strength of hydrogen peroxide Estimation of aspirin from the given tablet Preparation of phthalimide from phthalic anhydride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Preparation of dibenzylidene acetone Preparation of parabromo acetanilide	3 Hrs 3 Hrs
December 2013	13,14,15,16	Organic qualitative analysis Binary mixture -1 Organic qualitative analysis Binary mixture -2 Organic qualitative analysis Binary mixture -3 Organic qualitative analysis Binary mixture -4	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18,19	Organic qualitative analysis Binary mixture -5	3 Hrs

2014		Inorganic qualitative analysis mixture -1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Gawande M.J.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : S.Y.BSc Subject :Chemistry Batch No : V

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine critical solution temperature of phenol water system Determination of solubility of benzoic acid at different temperature and to determine H of dissociation process.	3 Hrs 3 Hrs
August 2013	3,4,5,6	To study neutralization of acid (HCL) By Base (NaOH) & CH_3COOH by NaOH & H_2SO_4 by NaOH To determine rate constant (or to study kinetics) of acid catalysed ester hydrolysis To determine rate constant (or to study kinetics) of base catalysed ester hydrolysis To determine molecular wt of given organic liquid by steam distillation	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Estimation of sodium carbonate content of washing soda To determine the strength of hydrogen peroxide Estimation of aspirin from the given tablet Preparation of phthalimide from phthalic anhydride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Preparation of dibenzylidene acetone Preparation of parabromo acetanilide	3 Hrs 3 Hrs
December 2013	13,14,15,16	Organic qualitative analysis Binary mixture -1 Organic qualitative analysis Binary mixture -2 Organic qualitative analysis Binary mixture -3 Organic qualitative analysis Binary mixture -4	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18,19	Organic qualitative analysis Binary mixture -5	3 Hrs

2014		Inorganic qualitative analysis mixture -1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Jejurkar P.S.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : S.Y.BSc Subject :Chemistry Batch No : VI

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine critical solution temperature of phenol water system Determination of solubility of benzoic acid at different temperature and to determine H of dissociation process.	3 Hrs 3 Hrs
August 2013	3,4,5,6	To study neutralization of acid (HCL) By Base (NaOH) & CH_3COOH by NaOH & H_2SO_4 by NaOH To determine rate constant (or to study kinetics) of acid catalysed ester hydrolysis To determine rate constant (or to study kinetics) of base catalysed ester hydrolysis To determine molecular wt of given organic liquid by steam distillation	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Estimation of sodium carbonate content of washing soda To determine the strength of hydrogen peroxide Estimation of aspirin from the given tablet Preparation of phthalimide from phthalic anhydride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Preparation of dibenzylidene acetone Preparation of parabromo acetanilide	3 Hrs 3 Hrs
December 2013	13,14,15,16	Organic qualitative analysis Binary mixture -1 Organic qualitative analysis Binary mixture -2 Organic qualitative analysis Binary mixture -3 Organic qualitative analysis Binary mixture -4	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18,19	Organic qualitative analysis Binary mixture -5	3 Hrs

2014		Inorganic qualitative analysis mixture -1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Jejurkar P.S.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : S.Y.BSc Subject :Chemistry Batch No : VII

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine critical solution temperature of phenol water system Determination of solubility of benzoic acid at different temperature and to determine H of dissociation process.	3 Hrs 3 Hrs
August 2013	3,4,5,6	To study neutralization of acid (HCL) By Base (NaOH) & CH_3COOH by NaOH & H_2SO_4 by NaOH To determine rate constant (or to study kinetics) of acid catalysed ester hydrolysis To determine rate constant (or to study kinetics) of base catalysed ester hydrolysis To determine molecular wt of given organic liquid by steam distillation	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Estimation of sodium carbonate content of washing soda To determine the strength of hydrogen peroxide Estimation of aspirin from the given tablet Preparation of phthalimide from phthalic anhydride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Preparation of dibenzylidene acetone Preparation of parabromo acetanilide	3 Hrs 3 Hrs
December 2013	13,14,15,16	Organic qualitative analysis Binary mixture -1 Organic qualitative analysis Binary mixture -2 Organic qualitative analysis Binary mixture -3 Organic qualitative analysis Binary mixture -4	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18,19	Organic qualitative analysis Binary mixture -5	3 Hrs

2014		Inorganic qualitative analysis mixture -1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Pawar D.C.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : S.Y.BSc Subject :Chemistry Batch No : VIII

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine critical solution temperature of phenol water system Determination of solubility of benzoic acid at different temperature and to determine H of dissociation process.	3 Hrs 3 Hrs
August 2013	3,4,5,6	To study neutralization of acid (HCL) By Base (NaOH) & CH_3COOH by NaOH & H_2SO_4 by NaOH To determine rate constant (or to study kinetics) of acid catalysed ester hydrolysis To determine rate constant (or to study kinetics) of base catalysed ester hydrolysis To determine molecular wt of given organic liquid by steam distillation	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Estimation of sodium carbonate content of washing soda To determine the strength of hydrogen peroxide Estimation of aspirin from the given tablet Preparation of phthalimide from phthalic anhydride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Preparation of dibenzylidene acetone Preparation of parabromo acetanilide	3 Hrs 3 Hrs
December 2013	13,14,15,16	Organic qualitative analysis Binary mixture -1 Organic qualitative analysis Binary mixture -2 Organic qualitative analysis Binary mixture -3 Organic qualitative analysis Binary mixture -4	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18,19	Organic qualitative analysis Binary mixture -5	3 Hrs

2014		Inorganic qualitative analysis mixture -1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Pawar D.C.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : S.Y.BSc Subject :Chemistry Batch No : IX

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	To determine critical solution temperature of phenol water system Determination of solubility of benzoic acid at different temperature and to determine H of dissociation process.	3 Hrs 3 Hrs
August 2013	3,4,5,6	To study neutralization of acid (HCL) By Base (NaOH) & CH_3COOH by NaOH & H_2SO_4 by NaOH To determine rate constant (or to study kinetics) of acid catalysed ester hydrolysis To determine rate constant (or to study kinetics) of base catalysed ester hydrolysis To determine molecular wt of given organic liquid by steam distillation	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Estimation of sodium carbonate content of washing soda To determine the strength of hydrogen peroxide Estimation of aspirin from the given tablet Preparation of phthalimide from phthalic anhydride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Preparation of dibenzylidene acetone Preparation of parabromo acetanilide	3 Hrs 3 Hrs
December 2013	13,14,15,16	Organic qualitative analysis Binary mixture -1 Organic qualitative analysis Binary mixture -2 Organic qualitative analysis Binary mixture -3 Organic qualitative analysis Binary mixture -4	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18,19	Organic qualitative analysis Binary mixture -5	3 Hrs

2014		Inorganic qualitative analysis mixture -1 Inorganic qualitative analysis mixture -2	3 Hrs 3 Hrs
February 2014	20,21,22	Inorganic qualitative analysis mixture -3 Inorganic qualitative analysis mixture -4 Inorganic qualitative analysis mixture -5 **Practical Revision**	3 Hrs 3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 22Total Clock Hrs : 66			

Prof.Gawande M.J.

Sign. of the Subject Teacher **Sign of Head of Department**

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester : IST/III **Class :T.Y.BSc** **Subject :Physical Chemistry**

Month & Year	Title of the Topic	No. of Lectures
June 2013	**Admission Process**	--------
July 2013	1. Kinetics of Homogeneous Reactions - molecularity and order, - First order reactions and its characteristics, - Second order reactions (with equal and unequal initial concentrations) and its characteristics, - Third order reactions (with equal initial concentrations) and its characteristics,	12
August 2013	- Pseudomolecular reactions, - Effect of temperature on rate of reaction, - The energy of activation. 2. Adsorption - Adsorption phenomenon - Adsorption of gases by solids, - Types of adsorption, - Adsorption isotherm - Freundlich and Langmuir , - Adsorption of solute by solids, - Applications of adsorption, - Catalysis of gaseous reactions by solid surfaces, - One reactant gas slightly, moderately and strongly adsorbed - Retarded reactions - The order of heterogeneous reactions.	12
September2013	3. Crystal Structure Crystallization and fusion process, - Crystallography, Crystal systems, - Properties of crystals, - Crystal lattice and unit cell, - Crystal structure analysis by X ray - The Laue method and Braggs method, - X-ray analysis of NaCl crystal system, - Calculation of d and λ for a crystal system. 4. Investigations of molecular structure - Molar refraction, - Electrical polarization of molecules,	16
October 2013	- Permanent dipole moment, - Determination of dipole moment, - Molecular spectra - Rotational, vibrational and Raman spectra	08
	TERM II	
November2013	1. Electrolytic conductance - Recapitulation of Electrolytic conductance, - Specific and equivalent conductance, - Variation of equivalent conductance with concentration, - Kohlrausch's law and its applications to determine i) Equivalent conductance at infinite dilution of a weak electrolyte, ii) The ionic product of water, iii) Solubility of sparingly soluble salts, - Migration of ions and ionic mobilities, absolute velocity of ions - Transport number determination by Hittorf;s method and moving boundary method, - Relation between ionic mobility, ionic conductance and transport number, - Ionic theory of conductance, - Debye-Huckel	12

	–Onsager equation and its validity, - Activity in solution, fugacity and activity coefficient of strong electrolyte,	
Decmber 2013	2. Electrochemical cells - Reversible and irreversible cells, - Emf and its measurements, - Standard cells, cell reaction and Emf, - Single electrode potential and its calculation, - Calculation of cell Emf, - Thermodynamics of cell Emf, - Types of electrodes, - Classification of electrochemical cells with and without transference, - Applications of Emf measurmenti) Solubility product of sparingly soluble salt, ii) Determination of pH, iii) Potentiometric titration	14
January 2014	3. Nuclear Chemistry - The atom, nucleus and outer sphere, classification of nuclides, nuclear stability and binding energy. - Discovery of radioactivity, types of radioactivity, general characteristics of radioactive decay and decay kinetics, - Measurements radioactivity, gaseous ion collection method, proportional and G.M.Counter, - Applications of radioactivity- Radiochemical principles in the use of tracers, Typical applications of radioisotopes as a tracer- i) Chemical investigations- reaction mechanism , ii) Sructure determination- phosphorus pentachloride and thiosulphate ion iii) Age determination- dating by 3H and 14C content, iv) Medical applications	12
February2014	4. Elements of Quantum Chemistry: concept of quantization, atomic spectra (no derivation), wave particle duality, uncertainty principle, wavefunction and its interpretation, well-behaved function, Hamiltonian (energy) operator, formulation of Schrodinger equation, particle in box (1D, 2D and 3D box) (no derivations), sketching of wavefunction and probability densities for 1D box, correspondence principle, degeneracy, applications to conjugated systems, Jahn teller effect and energies of 3 D box (lifting of degeneracy), harmonic oscillator, wavefunction and probability densities (no derivation), zero point energy and quantum tunneling..	10
Mar 2014	**Exam**	--
April 2014	**Exam**	

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester : Ist/ IIIrd Class : T.Y.BSc Subject :Inorganic Chemistry

Month & Year	Title of the Topic	No. of Lectures
June 2013	**Admission Process**	--------
July 2013	**Molecular Orbital Theory** Limitations of Valence Bond theory(VBT), Need of Molecular orbital theory (MOT), Features of MOT, Formation of molecular orbitals(MO's) by LCAO principle, Rules of LCAO combination, Different types of combination of Atomic orbital(AO's): S-S, S-P, P-P and d-d, Non-bonding combination orbitals(formation of NBMO), M.O. Energy level diagram for homonuclear diatomic molecules, Bond order and existence of molecule from bond order, Energy (β) and magnetic behavior for following molecules or ions: H2, H2 + , He2 + , Li2, Be2, B2, C2, N2, O2, O2 + , O2 - , O2 2-, F2, Ne2, M.O. energy level diagram, for heteronuclear diatomic molecule like CO, NO, HCl, HF. M.O. energy level diagram, for heteronuclear triatomic molecule like CO2, NO2	09
August 2013	**Coordination Chemistry** I. **INTRODUCTION TO COORDINATION CHEMISTRY** (1. General account and meaning of the terms involved in coordination chemistry: Coordinate bond, central metal atom or ions, ligand, double salt, complex compound, coordination number, charge on the complex ion, oxidation number of Metal ion, first and second coordination sphere. 2. Ligands: Definition, Classification, Chelates and chelating agents. 3. Formation Constant, inert and labile complexes. 4. IUPAC nomenclature of coordination compounds 5. Different geometries of coordination compounds with C.N.= 4 to C.N.=10 and examples of each geometry. II. **WERNER'S THEORY OF COORDINATION COMPOUNDS** Assumptions of Werner's coordination theory, Werner's formulation of Coordination compounds, Physical and chemical test to support his formulation of ionizable and non-ionizable complexes, Stereoisomerism in complexes with C.N.4 and C.N. 6 to identify the correct geometrical arrangement of the complexes. **III.ISOMERISM IN COORDINATION COMPLEXES** Definition of isomerism in complexes-Structural Isomerism and stereoisomerism, 1. Structural isomerism (ionization, hydrate, linkage, ligand, coordination position and polymerization isomers) 2. Stereoisomerism and its types-Geometrical isomerism and optical isomerism.	16
September 2013	**IV.SIDGWICK THEORY** Concept of Sidgwick's model, Scheme of arrow indication for M-L bond suggested by Sidgwick, Effective Atomic Number rule (EAN), Calculations of EAN value for different	16

	complexes and stability of complexes, Advantages and Drawbacks of Sidgwick's theory. **V.PAULING'S VALENCE BOND THEORY** Introduction of Valence Bond Theory (VBT), Need of concept of hybridization, Aspects of VBT, Assumptions, VB representation of tetrahedral, square planer, trigonalbipyramidal and octahedral complexes with examples, Inner and outer orbital complexes, Electro neutrality principle, Multiple bonding(dπ-pπ and dπ-dπ), Limitations of VBT. **VI.CRYSTAL FIELD THEORY** Introduction and need of Crystal Field Theory(CFT), Assumptions, Shapes and degeneracy of d orbital, Splitting of d-orbitals, Application of CFT to octahedral complexes, pairing energy(P) and distribution of electrons in eg and t2g level, calculation of magnetic moment using spin-only formula, Crystal Field Stabilization Energy (CFSE), calculation of CFSE in weak oh field and strong oh field complexes, Evidence for CFSE, Interpretation of spectra of complexes, calculation of 10 Dq and factors affecting magnitude of 10Dq, d-d transitions and colour of the complexes, Jahn-Teller distortion theorem for octahedral complexes and its illustration, CFT of tetrahedral and square planar 16 complexes, calculations of CFSE, Spectrochemical series, Nephelauxatic effect and Nephelauxetic series, Limitations of CFT, modified CFT (LFT), Problems related to calculation of 10 Dq, CFSE and spin only magnetic moment for octahedral, tetrahedral & square planar complexes. (i.e. for high spin & low spin complexes)	
October 2013	**VII.MOLECULAR ORBITAL THEORY OF COORDINATION COMPLEX** Introduction, Assumptions, MO treatment to octahedral complexes with sigma bonding, Formation of MO's from metal orbitals and Composite Ligand Orbitals (CLO), MO correlation diagram for octahedral complexes with sigma bonding, effect of π bonding, Charge transfer spectra, Comparison of VBT, CFT, and MOT. **Diwali Holidays**	08
	TERM-II	
Nov 2013	**Introduction to f-block element**	04
Dec 2013	**Chemistry of f- block elements** Introduction of f-block elements- on the basis of electronic configurations, occurrence and reactivity, F-block elements as Lanthanide and Actinide series I. Lanthanides Position in periodic table, Name and electronic configuration of lanthanides, Oxidation States, Occurrence and separation (Group/ Individual) by modern methods (ion exchange and solvent extraction method), Lanthanide contraction & its effect on chemistry of Lanthanides and post-lanthanide elements, applications of lanthanides II. Actinides Position in periodic table, Name and electronic Configuration of actinides, Oxidation States, Occurrence, and general methods of preparation of t ransuranic elements [viz., a) Neutron Bombardment, b) Accelerated projectile bombardment and c) Heavy ion bombardment], Nuclear Fuels-	10

	Nuclear Fusion fuels & nuclear fission fuels,IUPAC nomenclature system for super heavy elements with atomic no. (z) greater than100, Comparison between Lanthanides and Actinides. **Metals, semiconductors and Super conductors** Introduction and Defination of metal	
Jan 2014	**Metals, semiconductors and Super conductors** Introduction, Metallic bonding, Band theory in metals with respect to Na along with n (E) and N(E) diagrams, Electrical conductivity of metals (N a, Mg, Al), Valence electrons and conductivity of metals, Effect of temperature and impurity on electrical conductivity of metals, Semiconductors – types of Semiconductors: I. Intrinsic II. Extrinsic, effect of temperature and impurity on semiconductivity, N & P type semiconductors ZnOandNiO, Super conductivity- Discovery, Property, Models structure and superconductivity, Applications of superconductors **Ionic Solids** Crystalline and amorphous solids, crystal structures simple cubic, body centered cubic and face centered cubic, Properties of ionic solids, packing arrangements of anions in an ionic solids, Voids in crystal structure-tetrahedral and octahedral, I onic radius, Palings univalent and crystal radii, Conversion of univalent radii to crystal radii, problems based on conversion of radii, Radius ratio effect, Lattice energy, Born-Lande equation, Born Haber cycle and its applications, Schottky and Frenkel defect.	16
Feb 2014	**Organometalic Chemistry** Introduction, General principle, Carbonyl complexes, CO most important □□ligand, Binary carbonyl complexes, Synthesis 18 electron rule, Solid state structure of some neutral binary metal carbonyl Homogeneous catalysis by soluble transition metal complex, Feed stock for chemical industry,Hydroxylation (oxoreaction), Wacker process, Monsanto acetic acid synthesis **Thermodynamic properties of Coordination Complexes** CFSE: High spins octahedral complexes. CFSE: Tetrahedral complexes of site preferences CFSE: Low spin octahedral complexes Oxidation states of transition metal complexes in aqueous media. Ionization potential of transition complexes Qualitative survey of the substitution of co-ordination complexes **Bioinorganic Chemistry** I. Introduction, Role of metals in bioinorganic chemistry- a.Classification as enzymatic and non-enzymatic metals, Enzymatic redox metals such as Cu (SOD) and enzymatic non redox metals such as Zn (Hydrolase). b.Role of metal ions in non-enzymatic process- Na, K,Ca, Mg (one example of each and brief discussion). c.Role of metals in enzymatic processes-Transition metals- Catalase, peroxidase and nitrogenase (Redox active).	18
Mar 2014	**Bioinorganic Chemistry** II. Metalloproteins-Iron proteins-Introduction of Fe-S proteins, Electron	04

	transfer proteins (Fe-S, Fe2S2, Fe3S4, Fe4S4). Transport protein (transferrin) and Storage protein (ferritin) III. Bioinorganic Chemistry of Fe: Hemoglobin and myoglobin, its structure and functions. IV. Bioinorganic Chemistry of Co: Vitamin-B12, its structure and function. **Revision and Question paper solving**	
Apr 2014	**Annual Examination**	

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Teaching Plan of Theory Courses

Academic Year : 2013 - 2014

Term/Semester : III[rd] Class : TYBSc Subject : ORGANIC CHEMISTRY

Month & Year	Ttitle of the Topic	No. of Lectures
JUNE 2013	**ADMISSION PROCESS**	-
JULY 2013	**Strength of organic acids and bases** Introduction, pka, origin of acidity, influence of solvent, simple aliphatic saturated and unsaturated acids, substituted aliphatic acid, phenols, aromatic carboxylic acids, pka and temperature, pkb, aliphatic and aromatic bases, heterocyclic bases, acid base catalysis. **Stereochemistry of disubstituted cyclohexane** introduction, 1,1-alkyl disubstituted cyclohexane; Dimethyl cyclohexane 1,2; 1,3 and. Geometrical isomerism, Optical isomerism, stability of conformation, energy calculations.	08 Lec. 04
AUG 2013	3 **Nucleophilic substitution at aliphatic Carbon** Introduction, Nucleophile and leaving groups, Mechanism of nucleophilic substitution. The SN1 reaction: Kinetics, mechanism and stereochemistry (Racemization), stability of carbocation. The SN2 reaction: Kinetics, mechanism & stereochemistry (inversion). How to know whether a given reaction will follow SN1 or SN2 mechanism.SNi mechanism6. Aromatic Electrophilic and Nucleophilic substitution reactions (10) Introduction, arenium ion mechanism, Effect of substituent group (Orientation, o/p directing and meta directing groups). Classification of substituent groups (activating and deactivating groups) Mechanism of – Nitration, Sulfonation, Haloganation, Fridel-Crafts reactions, Diazo Coupling reactions, Ipso-substitution.Addition-elimination (SNAr), SN1, Elimination-addition (Benzyne) SNR1 reactions, reactivity. Aimsand objectives: Stud **4.Reactions of unsaturated hydrocarbons and carbon oxygen double bond** a) Reaction of Carbon-Carbon double bond: Introduction, Mechanism of electrophilic addition to C=C bond. Orientation & reactivity, Rearrangements, (Support for formation of carbocation). Addition of hydrohalogen, Anti Markownikoff's addition (peroxide effect) with mechanism, Addition of halogens (dl pairs and meso isomers), hypohalous acids (HOX), Hydroxylation (Mechanism of cis and trans 1,2- diols). Hydroboration- Oxidation (Formation of alcohol), Hydrogenation (Formation of alkane), Ozonolysis (formation of aldehydes & ketones) b) Reactions of Carbon –Carbon triple bond: Addition of hydrogen, halogens, halogen acids, water and formation of metal acetylides and its application c) Reactions of Carbon –Oxygen double bond: Introduction, Structure of carbonyl group, reactivity of carbonyl group, addition of Hydrogen cyanide, alcohols, thiols, water, ammonia derivatives, Cannizzaro and Reformaski reactions with mechanism. .	16Lec
SEPT 2013	**5.Elimination Reactions** Introduction; 1,1; 1,2 elimination,E1, E2 and E1cB mechanism with evidences, Hoffmann and Saytzeff's elimination, reactivity effect of structure, attacking and leaving group **6.Aromatic Electrophilic and Nucleophilic substitution reactions** Introduction, arenium ion mechanism, Effect of substituent group (Orientation, o/p directing and meta directing groups). Classification of	20 Lec

	substituent groups (activating and deactivating groups)	
	Total chapter: 06 Total lecture:48 lecture	
	TERM-II	
NOV 2013	**1. Spectroscopic methods in structure determination of Organic compounds A) Introduction:** i) Meaning of spectroscopy, nature of electromagnetic radiation, wave length, frequency, energy, amplitude, wave number, and their relationship, different units of measurement of wavelength frequency, different regions of electromagnetic radiations ii) Interaction of radiation with matter excitation of molecules with different energy levels, such as rotational, vibrational and electronic level. iii) Types of spectroscopy and advantages of spectroscopic methods. **B**) **Ultra Violet Spectroscopy** i) Introduction, Nature of U.V., Beer's law, absorption of U.V. radiation by organic molecule leading to different excitation. Terms used in U.V. Spectroscopy- Chromophore, Auxochrome, Bathochromic shift, hypsochromic shift, hyperchromic and hypochromic effect. ii) Effect of Conjugation on position of U.V. band. iii) Calculation of max by Woodward and Fiser rules for dienes and enone sustems. iv) Colour and visible spectrum. v) Applications of U.V. Spectroscopy- Determination of structure, Determination of stereo chemistry (Cis and trans)	**12 lec**
DEC 2013	**C) Infra red Spectroscopy** i) Introduction, Principle of I.R. Spectroscopy, Fundamental modes of vibrations (3N-6,3N-5) Types of vibrations, (Stretching, bending) ii) Condition of absorption of I.R.radiations, vibration of diatomic molecules. iii) Parts of I.R. Spectrum, fundamental group region, finger, print region. iv) Characteristic of I.R. absorption of following functional groups- a) Alkanes, alkenes, alkynes b) Alcohol and ethers c) Alkylhalides d) Carbonyl compounds (-CHO, C=O,-COOR-COOH) e) Amines and amides. f) Aromatic Compounds and their substitution Patterns. v) Effect of following factors on I.R. absorption-Inductive effect, resonance effect, hydrogen bonding vi) Application of I.R. Spectroscopy- a) Determination of structure, identification of functional group, comparison with finger print region b) Study of chemical reaction, c) Hydrogen bonding D) NMR Spectroscopy (Only PMR) i) Introduction, Principles of PMR Spectroscopy, Magnetic and nonmagnetic niclei, Precessional motion of nuclei without Mathematical details, Nuclear resonance, chemical shift, shielding, & deshielding. ii) Measurement of Chemical shift, d- Scale and T-scale. iii) TMS as reference and its advantages, peakarea, integration, spin-spin coupling, coupling constants, J-value (Only first order coupling be discussed) Problems:- Based on U.V., I.R. and NMR. Spectral Problem based on U.V., I.R. and NMR Data and relevant problems .	12Lec.
JAN 2014	**2. Retrosynthetic analysis and applications** a) Introduction, Different terms used – Disconnection, Sunthon, Synthetic equivalence, FGI, TM. b) One group disconnection with examples. c) Retrosynthesis and Synthesis of Following Target Molecules- i) Acetophenone ii) t-butylalcohol, iiii) Crotonaldehyde iv) Cyclohexene v) Cyclohexene-3-one vi) Benzoin vii) Cyclopentyl methanal viii) Benzylbenzoate ix) 2-Phenyl ethylbromide x) Benzyl diethyl malonate **3. REARRANGEMENT REACTION** – Introduction,mechanism of rearrangement reaction involving carbocation,nitrene and oxonium ion intermediate.Beckmann ,Bayer-villiger,Pinacole-pinacolone, Curtis,Favorski,Claisen rearrangement.	05Lec 06 lec
FEB 2014	**4.Carbanions and their reactions** i) Formation and stability of Carbanions ii) Reactions involving carbanions and their mechanisms a) Aldol b) Claisen c) Dieckmann d) Perkin iii) Synthesis and Synthetic applications of- a) Malonic ester b) Acetoacetic ester c) Wittig reagent.	06 lec

	5) Natural Products A) Terpenoids:- i) Introduction, Isolation, Classification. ii) Citral- structure determination using chemical and spectral methods, Synthesis Citral by Barbier and Bouveault Synthesis. B) Alkaloids:- i) Introduction, extraction , Purification, Some examples of Alkaloids and their natural sources. ii) Ephedrine- structure determination using comical and spectral methods, Synthesis of Ephedrin by Nagi. Synthesis.	07 lec
MAR 2014	**EXAM**	---------
APRIL 2014	**EXAM**	---------
	Total chapter:05 no.of lecture: 48	

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Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester : ISt/III Class : T.Y.BSc Subject : Analytical Chemistry

Month & Year	Title of the Topic	No. of Lectures
June 2013	**Admission Process**	--------
July 2013	**1. Gravimetric Analysis** Common ion effect and solubility product principles, Conditions for good precipitation, Factors affecting precipitation like acid, temperature, nature of solvent, Super saturation and precipitation formation, Precipitation from homogeneous solution and examples, Co-precipitation, post precipitation and remedies for their minimization, Washing of precipitate and ignition of precipitate,Brief idea about method of filtration and drying of precipitate, Introduction to electrogravimetry: principle, applications, electrolytic separations of Cu and Ni, Numerical problems only on gravimetric analysis. **2. Thermal methods of analysis** Principle of thermal analysis, classification of thermal techniques, Principle, instrumentation and applications of TGA and DTA, factors affecting the thermal analysis, numerical problem.	12
August 2013	**3. Spectrophotometry** Introduction, Electromagnetic spectrum, Interaction of electromagnetic radiations with the matter, Mathematical Statement and derivation of Lambert's Law and Beer's Law, Terminology involved in spectrophotometric analysis, Instrumentation of single beam colorimeter, Instrumentation of single and double beam spectrophotometer, Principle of additivity of absorbance and simultaneous determination, Spectrophotometric Titrations, Experimental Applications-Structure of organic compounds, Structure of complexes, Numerical Problems	12
September2013	**4. Polarography** Introduction to voltammetric methods of analysis, Principles of polarographic analysis, Dropping Mercury Electrode, Instrument and working of polarographic apparatus, Ilkovic equation and quantitative analysis, Polarogram and chemical analysis, Analysis of mixture of cations, Factors affecting polarographic wave, Quantitative Applicationsles Numerical Problems **5. Atomic Absorption Spectroscopy** Introduction and theory of atomic absorption spectroscopy,	12

	Instrumentation of single beam atomic absorption Spectrophotometer	
October 2013	Measurement of absorbance of atomic species by AAS, Spectral and Chemical Interferences, Qualitative and Quantitative Applications of AAS. Numerical Problems. **6. Flame Emission Spectroscopy** Introduction and theory of atomic emission spectroscopy, Instrumentation of single beam flame emission spectrophotometer, Measurement of emission of atomic species, Interferences in emission spectroscopy, Methods of analysis- calibration curve method, Standard addition method, and internal, standard method, Qualitative and Quantitative Applications of FES, Numerical Problems.	12
Nov 2013	**Diwali vacation TERM-II**	--------
Nov 2013	**1. Solvent Extraction:** Introduction ,principle of solvent extraction ,Distribution -coefficient, Distribution ratio, Relationship between KD and D factors, affecting .percentage extracted, Extraction method , Separation factors ,Application, Numerical problem **2. Chromatography** : Introduction & classification of chromatographic method ,Principle of chromatographic analysis with match box model, Theoretical plates and column efficiency ,Theory , Principle, Technique and application of column ,Ion exchange, thin layer and paper chromatography , Numerical problems	08
Dec 2013	**3. Gas Chromatography:-**Introduction, Theory, Principal, GLC &GSC ,Separation mechanism, Instrumentation of gas chromatography, Working of gas chromatography, Gas Chromatogram and qualitative & quantitative analysis , Application of gas chromatography	12
Jan 2014	**4. High performance liquid chromatography:-**Introduction, Need of liquid chromatography , Separation mechanism involved in adsorption & partition of HPLC Application of HPLC technique. Instrumentation of working of HPLC .Application of HPLC .Introduction to super critical fluid chromatography	09
Feb 2014	**Nephelometry and Turbidimetry**. **Nephelometry &Turbidimetry :-**Introduction ,Principles Instrumentation of Nephelometric & turbidimetric analysis .Difference between Nephelometric & turbidimetric measurements, choice between Nephelometry & turbidimetry, factors affecting Nephelometric & turbidimetic measurements , Quantitative applications, Numerical problems	06
March 2014	**5 .Electrophoresis:** Introduction, Principle and theory of electrophoresis, Different types of electrophoresis techniques , moving boundary electrophoresis, zone electrophoresis, - paper ,cellulose acetate electrophoresis and gel electrophoresis. Application of electrophoresis.	06
April 2014	Exam	

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Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester : Ist/IIIrd Class :T.Y.BSc Subject :Industrial Chemistry

Month & Year	Title of the Topic	No. of Lectures
June 2013	**Admission Process**	--------
July 2013	**1. Modern Approach to Chemical Industry (08)** Introduction, basic requirements of chemical industries, chemical production, raw materials, unit process and unit operations, Quality control, quality assurance, process control, research and development, pollution control, human resource, safety measures, classification of chemical reactions, batch and continuous process, Conversion, selectivity and yield, copy right act, patent act, trade marks **2. Agrochemicals** General introduction and scope of agrochemicals, meaning and examples of: Insecticides, Herbicides, Fungicides, Rodenticides, Pesticides, Plant growth regulators. Pesticide formulation, slow release pesticide formulations, storage stability test, and Industrial entomology. Advantages and disadvantages of agrochemicals.	12
August 2013	**2. Agrochemicals** Structure,: DDT, BHC, Warfarin, Aldrin, Endosulphan,synthesis and application:DDT, BHC andEndosulphan. Biopesticides like Neem oil and Karanj oil. **3. Manufacture of Basic Chemicals** a) Ammonia: Physicochemical principles involved, Manufacture of ammonia by modified Haber- Bosch process, its uses. b) Sulphuric acid: Physicochemical principles involved, Manufacture of sulphuricacid by contact process, its uses. c) Nitric acid: Physicochemical principles involved, Manufacture of nitric acid by Ostwald's process, its uses.	12
September 2013	**4. Petrochemicals and eco-friendly fuels** *a)*Introduction, occurrence, composition of petroleum, resources, processing of petroleum, calorific value of fuel, cracking, octane rating (octane number), cetane number, flashpoint, and petroleum refineries, applications of petrochemicals, synthetic petroleum, lubricating oils & additives *b)Fuels and eco-friendly fuels:* liquid, gaseous fuel (LPG, CNG), fossil fuels, diesel, bio diesel, gasoline, aviation fuels. Use of solar energy for power generation.	12
October 2013	**5. Food and Starch Industry** **Food Industry**:	

	(a) Definition and scope, nutritive aspects of food constituents, , food deterioration factors and their control; (b) Preservation and processing: Heat and cold preservation and processing, cold storage, food dehydration and concentration, various foods, their processing and preservation methods, fruits, beverages, cereals, grains, legumes and oil seeds; (c) Food additives: Enhancers, sugar substitutes, sweeteners, food colors, **6. Cement and Glass industry** **Cement industry:** Introduction, Importance, composition of portland cement, raw materials, proportioning oraw materials, setting and Hardening of cement, reinforced concrete.	12
	TERM-II	
NOV 2013	**1. Polymer chemistry** Classification of Polymers: Organic and Inorganic polymers (a) Basic concepts, nomenclature, degree of polymerization, classification of polymerization reactions, thermodynamic and transport properties of polymer b)*Commercial polymers and their importance:* (a) Nylon, polyesters (terylene and dacron), rubber, vulcanization of rubber, synthetic rubber, Bun 2-N rubber, copolymers of butadiene, PVC, acrylic, teflon, polyethylene and acrylonitrile; (b) Silicone polymers: silicone oils, rubber, grease and resin; (c) Resins: Phenol-formaldehyde resins, urea-formaldehyde resins, epoxy resins, melamine-formaldehyde resins; **Sugar and Fermentation Industry** Sugar: Occurrence, Manufacturing of refine cane sugar from sugar cane, general idea of carbonation and sulphitation processes and their comparison, by-product and their use. **Fermentation Industry**: Introduction, importance, Basic requirement of fermentation process, Manufacture of industrial alcohol from molasses, fruits, food grains, & ethylene, Manufacturing of wine, beer, whisky, rum ; importance Power alcohol	10 08
DEC 2013	**3. Soap, detergents and Cosmetics** A. Chemistry of soap, row material, chemical reaction, types of soap. B. Meaning of the terms detergent and surfactants, emulsion and emulsifying agents, wetting and non-wetting, hydrophobic and hydrophilic nature, amphipathic structures, types of surfactants, raw materials for detergents, washing action of soaps and detergents, detergent builders, additives. 44 C. Raw materials: emulsifiers (natural, synthetic and finely dispersed solids), lipid components (oils, waxes, fats), humectants, colours (dyes and pigments), preservatives and antioxidants. (b) Cosmetics for skin: Types and problems of skin, key ingredients of skin cleansing, toners, moisturizers, nourishing, protective sunscreen, talcum powder and bleaching products. (c) Hair	08

	care: classification, ingredients, special additives for conditioning and scalp health, hair colourants (temporary, semi-permanent and gradual colourants), the plant materials (herbs) used in hair cosmetics.	
JAN 2014	**4. Dyes and paints** (a)*Dyes:* Introduction, classification of dyes: Structures and applications, nitro, nitroso, azo, heterocyclic, phthalenes, xanthenes, rhodamines, thiazine, cyanine, anthraquinone, indigoids, thioindigoids, phthalocyanines, wet dyes. (b) *Paints:* Introduction of paints, ingredients and classification, new technologies; properties of coatings; solvents, plasticizers, dyes and bioactive additives; (c) *Pigments:* Introduction, classification and general physical properties.	12
FEB 2014	**5. Chemistry of pharmaceutical industries** *a. General aspects of drug action:* Introduction, classification, nomenclature, structure-activity relationship, action of drugs, factors affecting drug action, metabolism of drugs, chemical structures, methods of production and pharmacological activity. *b.* Meaning of the terms: Prescriptions, doses, analgesic, antipyretic, diuretic, anesthetics, antibiotics, anti-inflammatory, anti-viral, tranquilizer, antiulcer, antialargic and bronchodilators, cardiovascular, cold preparations, anti-hypertensive, cough preparation, anti-neoplastic, sedative and hypnotics, steroidal, contraceptive, histamine and antihistamine. *c.* Synthesis and uses: Paracetamol, Aspirin, Sulphanilamide.	06
MAR 2014	**6. Pollution prevention and waste management** Introduction, importance of waste management, concept of atom economy, Terms involved in waste minimization: source reduction, recycling, product changes, source control, use and reuse, reclamation, assessment procedures, types of wastes, treatment and disposal of industrial waste. Treatment of wastes or effluents with organic impurities.Treatment of wastes or effluents with inorganic impurities. The nature, effect and treatment of some important chemical wastes-(Pulp and paper industries, soap and detergent industries and food processing industries).	04
APRIL-2014	**UNI.EXAM**	

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner-

Teaching Plan of Theory Courses

Academic Year : 2013-2014

Term/Semester : Ist/IIIrd Class : T.Y.BSc Subject : Environmental Chemistry

Month & Year	Title of the Topic	No. of Lectures
June 2013	**Admission Process**	--------
July 2013	**Chapter 1**: Concepts and scope of Environmental Chemistry 1.1 Introduction 1.2 Terminologies 1.3 Units of concentration 1.4 Segments of Environment **Chapter 2:** Atmosphere (08) 2.1 Composition and structure of atmosphere 2.2 Evolution of Atmosphere 2.3 Earth radiation balance 2.4 Chemical and photochemical reactions in atmosphere 2.5 Chemistry of O3, SOx, NOx and chlorides in atmosphere	09
August 2013	**Chapter 3: Air Pollution** 3.1 Primary air pollutants 3.2 Sources, sinks, and control of CO, SOx, NOx and HC. 3.3 Sampling of air 3.4 Particulate matter: inorganic and organic 3.5 Smog: reducing and photochemical 3.6 Radioactivity in atmosphere 3.7 Effect of atmosphere pollution on biosphere and corrosion 3.8 Chemistry of some air pollution incidents, London smog (**Chapter 4: Hydrosphere** .1 Water resources 4.2 Physical chemistry of sea water: composition, equilibria, pH, pE 4.3 Aquatic environment and stratification of water bodies. 4.4 Complexation in natural and waste water	16
September 2013	4.5 Humic substances 4.6 Microbially mediated aquatic reactions, nitrogen cycle, iron and manganese bacteria **Chapter 5:** Water Pollution 5.1 Classification of water pollutants 5.2 Organic pollutants 5.3 Pesticides : Classification, persistence, biodegradation 5.4 Detergents 5.5 Eutrophication 5.6 Marine pollution 5.7 Oil pollution 5.8 Inorganic pollutants : Acid mine drainage, remedial measures, sediments and radioactive material 5.9 Thermal pollution 5.10 Water quality parameters for drinking, surface and irrigation 5.11 Sampling and monitoring water quality parameters: pH, D.O.	16
October 2013	(Winkler Method), COD, TOC, Total hardness, free chlorine. 5.12 Chemical specification of Hg, Pb, As 5.13 Chemistry of some water pollution cases: Minamata, arsenic, calamity in West Bengal/Indian rivers **Chapter 6:** Environmental Health and Toxicology (06)	10

	6.1 Types of environmental health hazards, 6.2 Soil toxicology, 6.3 Toxic chemicals, organic and inorganic chemicals in the soil, 6.4 Pesticides and human health, 6.7 Geological hazards of Earthquakes, Volcanoes, Floods, Land slides, Erosion	
	TERM-II	
NOV 2013	**Chapter 1**: Water treatment and effluent management 1.1 Domestic sewage, waste water treatment: primary, secondary and tertiary treatments, aerobic, anaerobic and upflow anaerobic sludge bed treatment processes 1.2 Industrial waste water treatment i) filtration method ii) ion-exchange method iii) membrane techniques: ultrafiltration, reverse osmosis and electrodialysis 1.3 Treatment of drinking water **Chapter 2:** Lithosphere and solid waste management 2.1 Composition of lithosphere and types of soil. 2.2 Organic and inorganic components of soil 2.3 Acid base and ion exchange reactions in soil and pH of soil 2.4 Chemistry of disposal of solid waste i) sanitary landfills ii) incinerators iii) pyrolysis	12
DEC 2013	**Chapter 3:** Instrumental methods in environmental analysis 3.1 Atomic absorption spectroscopy: basic principle and working, HC lamp as source, flames and furnaces as cells, working curve, application to determination of Hg, As, Be, Zn, Ag, Pb, Mn, Fe, Cu, Cr, Cd 3.2 Gas chromatography: basic principle and working, requirements of carrier gas and simple, packed columns, capillary columns, retention time, detectors based on thermal conductivity, electron capture and flame ionization, GC—MS application to detection and determination of CO, HC and pesticides 3.3 HPLC: use for nonvolatile solutes, principle, working with respect to column, packing material, solvent and detectors, application to determination of pesticides, PAH as metabolites 3.4 Spectrophotometry: determination of NOx, SO2 (Dasgupta method), NH3, CN, PO4, Cd, Pb, hg by their chemical transformation into appropriate coloured compound and measurement at corresponding max value. 3.5 Chemiluminescence: determination of NOx and O3. 3.6 Non Despersive IR spectrometry of determination of CO 3.7 Ion selective electrodes: basic principle and working, solid state membrane electrode, glass and fluoride, liquid ion-exchange electrode for NO3 and dissolved oxygen (D. O.)	15
JAN 2014	**Chapter 4**: Natural resources, energy and environment 4.1 Natural resources: wood, coal and mineral resources 4.2 Cleaner coal combustion by coal conversion: synthane gasifier, methanol, gasohol, solvent refined coal, magneo hydrodynamic generator 4.3 Non conventional energy sources: solar, nuclear fission and fusion,	16

	dihydrogendioxygen fuel cell, green gas technology.	
FEB 2014	**Chapter 5:** Green House Effect and Global Warming 5.1 Introduction 5.2 Green house gases 5.3 Radiative forcing 5.4 Sources and sinks of CO2 5.5 Causes of fluctuations in global temperature 5.6 Global warming and climate changes 5.7 Implications of climate changes	12
MAR 2014	**Chapter 6:** Ozone Layer: The earth protective umbrella 6.1 Creation of ozone layer 6.2 Mechanism of ozone depletion 6.3 Probing the ozone shield and ozone hole 6.4 Effects of ozone depletion 6.5 Chloroflourocarbons (CFCs) 6.6 Stability and reactions of CFCs 6.7 Harmful effects of CFCs 6.8 CFCs substitutes 6.9 Remedial steps.	06

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S.B.V.P.Samaj's

SahakarMaharshiBhausahebSantujiThorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013 - 2014

Term/Semester : III&IV **Class :T.Y.B.Sc** **Subject :Physical Chemistry** **Batch No : I**

Month & Year	Practical No.	Name of Practical	Time Reqd.
JUNE 2013	----------	**Admission Process**	
JUly 2013	**1,2**	Refractrometry-Molar Refraction	3hrs
		Refractrometry-% Composisition of Liquid	3hrs
Aug 2013	3,4,5,6	Refractrometry- Homo logues Series of Akohol	3hrs
		Colorimetry- ƛ max – Cupper Sulphate	3hrs
		Colorimetry- ƛ max – $KMnO_4$	3hrs
		Colorimetry- Indicator Constant	3hrs
Sept 2013	7,8,9,10	pH Metry- Degree of Hydrolysis of Aniline Hydrochloride	3hrs
		pH Metry-pKa of Weak Acid	3hrs
		Condoctometry- Cell Constant Disosiaction Constant	3hrs
		Condoctometry-Estimate the Amount of lead Present in Lead Nitrate	3hrs
Oct 2013		**University Examination**	
Nov 2013	11,12	Condoctometry-Titration of Acid & Base	3hrs
		Phenol Water System (A&B)	3hrs
Dec 2013	13,14,15,16	Kinetics - Hydrolysis of Ester	3hrs
		Kinetics –Relative strength of Acid	3hrs
		Viscosity- Molucular Weight of High Polymer	3hrs
		Adsortion-Validity of Freundlich & Langmuir Isotherm	3hrs
Jan 2014	17,18	Potentiometry- pKa of Acid	3hrs
		Potentiometry- Acid Base Titration	3hrs

Feb 2014	19,20	Kinetics –Iodination of Acetone Colorimetry-Indicator Constant of Indicator Revision of Practicals	3hrs 3hrs
Mar 2014		**University Practical Examination**	
Total Practical : 20		**Total Clock Hours : 60**	

Prof.Pawar D.C.

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S.B.V.P.Samaj's

Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013 - 2014

Term/Semester : III&IV **Class :T.Y.B.Sc** **Subject :Physical Chemistry** **Batch No : II**

Month & Year	Practical No.	Name of Practical	Time Reqd.
JUNE 2013	----------	**Admission Process**	
JUly 2013	**1,2**	Refractrometry-Molar Refraction Refractrometry-% Composisition of Liquid	3hrs 3hrs
Aug 2013	3,4,5,6	Refractrometry- Homo logues Series of Akohol Colorimetry- ƛ max – Cupper Sulphate Colorimetry- ƛ max – $KMnO_4$ Colorimetry- Indicator Constant	3hrs 3hrs 3hrs 3hrs
Sept 2013	7,8,9,10	pH Metry- Degree of Hydrolysis of Aniline Hydrochloride pH Metry-pKa of Weak Acid Condoctometry- Cell Constant Disosiaction Constant Condoctometry-Estimate the Amount of lead Present in Lead Nitrate	3hrs 3hrs 3hrs 3hrs
Oct 2013		**University Examination**	
Nov 2013	11,12	Condoctometry-Titration of Acid & Base Phenol Water System (A&B)	3hrs 3hrs
Dec 2013	13,14,15,16	Kinetics - Hydrolysis of Ester Kinetics –Relative strength of Acid Viscosity- Molucular Weight of High Polymer Adsortion-Validity of Freundlich & Langmuir Isotherm	3hrs 3hrs 3hrs 3hrs
Jan 2014	17,18	Potentiometry- pKa of Acid Potentiometry- Acid Base Titration	3hrs 3hrs

Feb 2014	19,20	Kinetics –Iodination of Acetone Colorimetry-Indicator Constant of Indicator Revision of Practicals	3hrs 3hrs
Mar 2014		**University Practical Examination**	
Total Practical : 20		**Total Clock Hours : 60**	

Dr.S.S.Borhade

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013 - 2014

Term/Semester : III&IV **Class :T.Y.B.Sc** **Subject :Physical Chemistry** **Batch No : III**

Month & Year	Practical No.	Name of Practical	Time Reqd.
JUNE 2013	----------	**Admission Process**	
JUly 2013	**1,2**	Refractrometry-Molar Refraction Refractrometry-% Composisition of Liquid	3hrs 3hrs
Aug 2013	3,4,5,6	Refractrometry- Homo logues Series of Akohol Colorimetry- ƛ max – Cupper Sulphate Colorimetry- ƛ max – $KMnO_4$ Colorimetry- Indicator Constant	3hrs 3hrs 3hrs 3hrs
Sept 2013	7,8,9,10	pH Metry- Degree of Hydrolysis of Aniline Hydrochloride pH Metry-pKa of Weak Acid Condoctometry- Cell Constant Disosiaction Constant Condoctometry-Estimate the Amount of lead Present in Lead Nitrate	3hrs 3hrs 3hrs 3hrs
Oct 2013		**University Examination**	
Nov 2013	11,12	Condoctometry-Titration of Acid & Base Phenol Water System (A&B)	3hrs 3hrs
Dec 2013	13,14,15,16	Kinetics - Hydrolysis of Ester Kinetics –Relative strength of Acid Viscosity- Molucular Weight of High Polymer Adsortion-Validity of Freundlich & Langmuir Isotherm	3hrs 3hrs 3hrs 3hrs
Jan 2014	17,18	Potentiometry- pKa of Acid Potentiometry- Acid Base Titration	3hrs 3hrs

Feb 2014	19,20	Kinetics –Iodination of Acetone Colorimetry-Indicator Constant of Indicator Revision of Practicals	3hrs 3hrs
Mar 2014		**University Practical Examination**	
Total Practical : 20		**Total Clock Hours : 60**	

Prof.Pawar D.C.

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SahakarMaharshiBhausahebSantujiThorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013 - 2014

Term/Semester : III&IV **Class :T.Y.B.Sc** **Subject :Physical Chemistry** **Batch No : IV**

Month & Year	Practical No.	Name of Practical	Time Reqd.
JUNE 2013	----------	**Admission Process**	
JUly 2013	**1,2**	Refractrometry-Molar Refraction	3hrs
		Refractrometry-% Composisition of Liquid	3hrs
Aug 2013	3,4,5,6	Refractrometry- Homo logues Series of Akohol	3hrs
		Colorimetry- ƛ max – Cupper Sulphate	3hrs
		Colorimetry- ƛ max – $KMnO_4$	3hrs
		Colorimetry- Indicator Constant	3hrs
Sept 2013	7,8,9,10	pH Metry- Degree of Hydrolysis of Aniline Hydrochloride	3hrs
		pH Metry-pKa of Weak Acid	3hrs
		Condoctometry- Cell Constant Disosiaction Constant	3hrs
		Condoctometry-Estimate the Amount of lead Present in Lead Nitrate	3hrs
Oct 2013		**University Examination**	
Nov 2013	11,12	Condoctometry-Titration of Acid & Base	3hrs
		Phenol Water System (A&B)	3hrs
Dec 2013	13,14,15,16	Kinetics - Hydrolysis of Ester	3hrs
		Kinetics –Relative strength of Acid	3hrs
		Viscosity- Molucular Weight of High Polymer	3hrs
		Adsortion-Validity of Freundlich & Langmuir Isotherm	3hrs
Jan 2014	17,18	Potentiometry- pKa of Acid	3hrs
		Potentiometry- Acid Base Titration	3hrs

Feb 2014	19,20	Kinetics –Iodination of Acetone Colorimetry-Indicator Constant of Indicator Revision of Practicals	3hrs 3hrs
Mar 2014		**University Practical Examination**	
Total Practical : 20		**Total Clock Hours : 60**	

Dr.Borhade S.S.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : T.Y.BSc Subject : Inorganic Chemistry Batch No :I

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	Gravimetric estimations 1. Fe as Fe_2O_3 2. Nickel as Ni – DMG	3 Hrs 3 Hrs
August 2013	3,4,5,6	Gravimetric estimations 3. Al as Aluminum oxide Volumetric Estimations 1. Mn by volhard method 2. Analysis of Alkali mixture by Volumetric method 3. Estimation of % purity of given sample of Sodium Chloride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Inorganic preparations 1. Preparation of $[Ni(NH_3)_6]^{2+}$ 2. Preparation of Trioxalatoferrate and estimation of oxalate using permagnometry. 3. Preparation of $[Cu(NH_3)_4]SO_4$ and estimation of Copper Idometrically. Colorimetric Estimations 1. Cobalt	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Separation of binary mixture of cations by Column Chromatography Mixture no 1 Mixture no 2	3 Hrs 3 Hrs
December 2013	13,14,15,16	Mixture no 3 Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture-2 Inorganic qualitative analysis mixture-3	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18	Inorganic qualitative analysis mixture-4	3 Hrs

2014		Inorganic qualitative analysis mixture -5	3 Hrs
February 2014	19,20	Inorganic qualitative analysis mixture -6 Industrial Visit Tour report **Practical Revision**	3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 20Total Clock Hrs : 60			

Prof.Surve S.B.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : T.Y.BSc Subject : Inorganic Chemistry Batch No :II

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	Gravimetric estimations 1. Fe as Fe_2O_3 2. Nickel as Ni – DMG	3 Hrs 3 Hrs
August 2013	3,4,5,6	Gravimetric estimations 3. Al as Aluminum oxide Volumetric Estimations 1. Mn by volhard method 2. Analysis of Alkali mixture by Volumetric method 3. Estimation of % purity of given sample of Sodium Chloride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Inorganic preparations 1. Preparation of $[Ni(NH_3)_6]^{2+}$ 2. Preparation of Trioxalatoferrate and estimation of oxalate using permagnometry. 3. Preparation of $[Cu(NH_3)_4]SO_4$ and estimation of Copper Idometrically. Colorimetric Estimations 1. Cobalt	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Separation of binary mixture of cations by Column Chromatography Mixture no 1 Mixture no 2	3 Hrs 3 Hrs
December 2013	13,14,15,16	Mixture no 3 Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture-2 Inorganic qualitative analysis mixture-3	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18	Inorganic qualitative analysis mixture-4	3 Hrs

2014		Inorganic qualitative analysis mixture -5	3 Hrs
February 2014	19,20	Inorganic qualitative analysis mixture -6 Industrial Visit Tour report **Practical Revision**	3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 20Total Clock Hrs : 60			

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : T.Y.BSc Subject : Inorganic Chemistry Batch No :III

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	Gravimetric estimations 1. Fe as Fe_2O_3 2. Nickel as Ni – DMG	3 Hrs 3 Hrs
August 2013	3,4,5,6	Gravimetric estimations 3. Al as Aluminum oxide Volumetric Estimations 1. Mn by volhard method 2. Analysis of Alkali mixture by Volumetric method 3. Estimation of % purity of given sample of Sodium Chloride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Inorganic preparations 1. Preparation of $[Ni(NH_3)_6]^{2+}$ 2. Preparation of Trioxalatoferrate and estimation of oxalate using permagnometry. 3. Preparation of $[Cu(NH_3)_4]SO_4$ and estimation of Copper Idometrically. Colorimetric Estimations 1. Cobalt	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Separation of binary mixture of cations by Column Chromatography Mixture no 1 Mixture no 2	3 Hrs 3 Hrs
December 2013	13,14,15,16	Mixture no 3 Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture-2 Inorganic qualitative analysis mixture-3	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18	Inorganic qualitative analysis mixture-4	3 Hrs

2014		Inorganic qualitative analysis mixture -5	3 Hrs
February 2014	19,20	Inorganic qualitative analysis mixture -6 Industrial Visit Tour report **Practical Revision**	3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 20Total Clock Hrs : 60			

Prof.Surve S.B.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013-2014

Term/Semester : Ist& IIndClass : T.Y.BSc Subject : Inorganic Chemistry Batch No :IV

Month & Year	Practical No	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
July 2013	1,2	Gravimetric estimations 1. Fe as Fe_2O_3 2. Nickel as Ni – DMG	3 Hrs 3 Hrs
August 2013	3,4,5,6	Gravimetric estimations 3. Al as Aluminum oxide Volumetric Estimations 1. Mn by volhard method 2. Analysis of Alkali mixture by Volumetric method 3. Estimation of % purity of given sample of Sodium Chloride	3 Hrs 3 Hrs 3 Hrs 3 Hrs
September 2013	7,8,9,10	Inorganic preparations 1. Preparation of $[Ni(NH_3)_6]^{2+}$ 2. Preparation of Trioxalatoferrate and estimation of oxalate using permagnometry. 3. Preparation of $[Cu(NH_3)_4]SO_4$ and estimation of Copper Idometrically. Colorimetric Estimations 1. Cobalt	3 Hrs 3 Hrs 3 Hrs 3 Hrs
October 2013		**University Examination**	
November 2013	11,12	Separation of binary mixture of cations by Column Chromatography Mixture no 1 Mixture no 2	3 Hrs 3 Hrs
December 2013	13,14,15,16	Mixture no 3 Inorganic qualitative analysis mixture-1 Inorganic qualitative analysis mixture-2 Inorganic qualitative analysis mixture-3	3 Hrs 3 Hrs 3 Hrs 3 Hrs
January	17,18	Inorganic qualitative analysis mixture-4	3 Hrs

2014		Inorganic qualitative analysis mixture -5	3 Hrs
February 2014	19,20	Inorganic qualitative analysis mixture -6 Industrial Visit Tour report **Practical Revision**	3 Hrs 3 Hrs
March 2014		**University Practical Examination**	
Total practical : 20Total Clock Hrs : 60			

Prof.Surve S.B.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013 - 2014

Term/Semester : III/IV Class : T.Y.BSc Subject : Organic Chemistry Practicals Batch : I

Month & Year	Practical No.	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
JUly 2013	1,2	**Organic Estimations** Estimations of Acatamide Estimations of Ethylbenzoate	 3hrs 3hrs
Aug 2013	3,4,5,6	**Organic Estimations** Determination of Molecular weight of Monobasic acids by Volumetric Methods. Determination of Molecular weight of Dibasic acids by Volumetric Methods. **Organic Preparations** P-Iodonitrobenzene from P-Nitroaniline (Sandmeyer Reaction quinone from Hydroquinone	 3hrs 3hrs 3hrs 3hrs
Sept 2013	7,8,9,10	**Organic Preparations** P-nitroacetanilide from Acetanilide (Nitration) Benzoic acid from Ethyl benzoate (Ester hydrolysis) **Separation of Binary Mixtures and Qualitative Analysis** Solid-Solid Mixture No 1: Acid-Base Mixture No 2: Acid-Phenol	 3hrs 3hrs 3hrs 3hrs
Oct 2013		**University Examination**	
Nov 2013	11,12	**Separation of Binary Mixtures and Qualitative Analysis** Solid-Solid Mixture No 3: Acid- Neutral Mixture No 4: Phenol-Base	 3hrs 3hrs
Dec 2013	13,14,15,16	**Separation of Binary Mixtures and Qualitative Analysis** Solid-Liquid	

		Mixture No 5: Phenol-Neutral Mixture No 6: Base-Neutral Mixture No 7: Acid-Base Mixture No 8: Acid-Phenol	3hrs 3hrs 3hrs 3hrs
Jan 2014	**17,18**	**Separation of Binary Mixtures and Qualitative Analysis** Liquid-Liquid Mixture No 9: Base-Neutral Mixture No 10: Neutral- Neutral.	 3hrs 3hrs
Feb 2014	**19,20**	**Separation of Binary Mixtures and Qualitative Analysis** Liquid-Liquid Mixture No 11: Phenol-Neutral Mixture No 12: Acid- Neutral Revision of Practicals	 3hrs 3hrs
Mar 2014		**University Practical Examination**	
Total Practical : 20		**Total Clock Hours :60**	

Dr.SCD

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S.B.V.P.Samaj's

Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013 - 2014

Term/Semester : III/IV Class : T.Y.BSc Subject : Organic Chemistry Practicals Batch : II

Month & Year	Practical No.	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
JUly 2013	1,2	**Organic Estimations** Estimations of Acatamide Estimations of Ethylbenzoate	 3hrs 3hrs
Aug 2013	3,4,5,6	**Organic Estimations** Determination of Molecular weight of Monobasic acids by Volumetric Methods. Determination of Molecular weight of Dibasic acids by Volumetric Methods. **Organic Preparations** P-Iodonitrobenzene from P-Nitroaniline (Sandmeyer Reaction quinone from Hydroquinone	 3hrs 3hrs 3hrs 3hrs
Sept 2013	7,8,9,10	**Organic Preparations** P-nitroacetanilide from Acetanilide (Nitration) Benzoic acid from Ethyl benzoate (Ester hydrolysis) **Separation of Binary Mixtures and Qualitative Analysis** Solid-Solid Mixture No 1: Acid-Base Mixture No 2: Acid-Phenol	 3hrs 3hrs 3hrs 3hrs
Oct 2013		**University Examination**	
Nov 2013	11,12	**Separation of Binary Mixtures and Qualitative Analysis** Solid-Solid Mixture No 3: Acid- Neutral Mixture No 4: Phenol-Base	 3hrs 3hrs
Dec 2013	13,14,15,16	**Separation of Binary Mixtures and Qualitative Analysis** Solid-Liquid	

		Mixture No 5: Phenol-Neutral Mixture No 6: Base-Neutral Mixture No 7: Acid-Base Mixture No 8: Acid-Phenol	3hrs 3hrs 3hrs 3hrs
Jan 2014	**17,18**	**Separation of Binary Mixtures and Qualitative Analysis** Liquid-Liquid Mixture No 9: Base-Neutral Mixture No 10: Neutral- Neutral.	 3hrs 3hrs
Feb 2014	**19,20**	**Separation of Binary Mixtures and Qualitative Analysis** Liquid-Liquid Mixture No 11: Phenol-Neutral Mixture No 12: Acid- Neutral Revision of Practicals	 3hrs 3hrs
Mar 2014		**University Practical Examination**	
Total Practical : 20		**Total Clock Hours :60**	

Prof.Gawande M.J.

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013 - 2014

Term/Semester : III/IV Class : T.Y.BSc Subject : Organic Chemistry Practicals Batch : III

Month & Year	Practical No.	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
JUly 2013	1,2	**Organic Estimations** Estimations of Acatamide Estimations of Ethylbenzoate	 3hrs 3hrs
Aug 2013	3,4,5,6	**Organic Estimations** Determination of Molecular weight of Monobasic acids by Volumetric Methods. Determination of Molecular weight of Dibasic acids by Volumetric Methods. **Organic Preparations** P-Iodonitrobenzene from P-Nitroaniline (Sandmeyer Reaction quinone from Hydroquinone	 3hrs 3hrs 3hrs 3hrs
Sept 2013	7,8,9,10	**Organic Preparations** P-nitroacetanilide from Acetanilide (Nitration) Benzoic acid from Ethyl benzoate (Ester hydrolysis) **Separation of Binary Mixtures and Qualitative Analysis** Solid-Solid Mixture No 1: Acid-Base Mixture No 2: Acid-Phenol	 3hrs 3hrs 3hrs 3hrs
Oct 2013		**University Examination**	
Nov 2013	11,12	**Separation of Binary Mixtures and Qualitative Analysis** Solid-Solid Mixture No 3: Acid- Neutral Mixture No 4: Phenol-Base	 3hrs 3hrs
Dec 2013	13,14,15,16	**Separation of Binary Mixtures and Qualitative Analysis** Solid-Liquid	

		Mixture No 5: Phenol-Neutral Mixture No 6: Base-Neutral Mixture No 7: Acid-Base Mixture No 8: Acid-Phenol	3hrs 3hrs 3hrs 3hrs
Jan 2014	**17,18**	**Separation of Binary Mixtures and Qualitative Analysis** Liquid-Liquid Mixture No 9: Base-Neutral Mixture No 10: Neutral- Neutral.	 3hrs 3hrs
Feb 2014	**19,20**	**Separation of Binary Mixtures and Qualitative Analysis** Liquid-Liquid Mixture No 11: Phenol-Neutral Mixture No 12: Acid- Neutral Revision of Practicals	 3hrs 3hrs
Mar 2014		**University Practical Examination**	
Total Practical : 20		**Total Clock Hours :60**	

Dr.SCD

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Sahakar Maharshi Bhausaheb Santuji Thorat College of Arts, Science & Commerce, Sangamner- 422605

Teaching Plan of Practical Courses

Academic Year : 2013 - 2014

Term/Semester : III/IV Class : T.Y.BSc Subject : Organic Chemistry Practicals Batch : IV

Month & Year	Practical No.	Name of Practical	Time Reqd.
June 2013	----------	**Admission Process**	
JUly 2013	1,2	**Organic Estimations** Estimations of Acatamide Estimations of Ethylbenzoate	 3hrs 3hrs
Aug 2013	3,4,5,6	**Organic Estimations** Determination of Molecular weight of Monobasic acids by Volumetric Methods. Determination of Molecular weight of Dibasic acids by Volumetric Methods. **Organic Preparations** P-Iodonitrobenzene from P-Nitroaniline (Sandmeyer Reaction quinone from Hydroquinone	 3hrs 3hrs 3hrs 3hrs
Sept 2013	7,8,9,10	**Organic Preparations** P-nitroacetanilide from Acetanilide (Nitration) Benzoic acid from Ethyl benzoate (Ester hydrolysis) **Separation of Binary Mixtures and Qualitative Analysis** Solid-Solid Mixture No 1: Acid-Base Mixture No 2: Acid-Phenol	 3hrs 3hrs 3hrs 3hrs
Oct 2013		**University Examination**	
Nov 2013	11,12	**Separation of Binary Mixtures and Qualitative Analysis** Solid-Solid Mixture No 3: Acid- Neutral Mixture No 4: Phenol-Base	 3hrs 3hrs
Dec 2013	13,14,15,16	**Separation of Binary Mixtures and Qualitative Analysis** Solid-Liquid	

		Mixture No 5: Phenol-Neutral Mixture No 6: Base-Neutral Mixture No 7: Acid-Base Mixture No 8: Acid-Phenol	3hrs 3hrs 3hrs 3hrs
Jan 2014	**17,18**	**Separation of Binary Mixtures and Qualitative Analysis** Liquid-Liquid Mixture No 9: Base-Neutral Mixture No 10: Neutral- Neutral.	 3hrs 3hrs
Feb 2014	**19,20**	**Separation of Binary Mixtures and Qualitative Analysis** Liquid-Liquid Mixture No 11: Phenol-Neutral Mixture No 12: Acid- Neutral Revision of Practicals	 3hrs 3hrs
Mar 2014		**University Practical Examination**	
Total Practical : 20		**Total Clock Hours :60**	

Prof.Gawande M.J.

Sign.of the Subject Teacher **Sign of Head of Department**