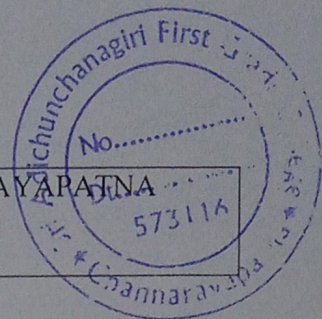


SRI ADICHUNCHANAGIRI FIRST GRADE COLLEGE, CHANNARAYANAPATNA
DEPARTMENT OF CHEMISTRY
B.Sc. First Semester (NEP)



LESSON PLAN FOR THE SESSION 2022-2023 (Odd Semester)

Name of the Faculty : Dr. N Shankarsh, Dr. B.N. Chandrashekar, Mrs. Premakumari.
Mrs. A.C, Apoorva
(Theory and Practical)

Semester : 1st

Title of the Paper : CHEMISTRY –I (DSC-1C)

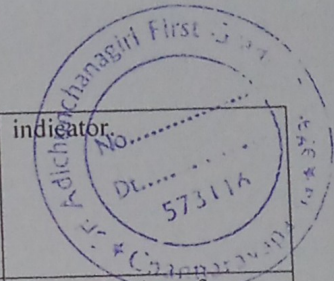
Subject code : CHEDSCP101

Lesson Plan Duration : 16 weeks

Total teaching period : 56 Hrs

Work Load (Lecture/Practical) Per Week (in hours): Lecture - 04, Practical – 04

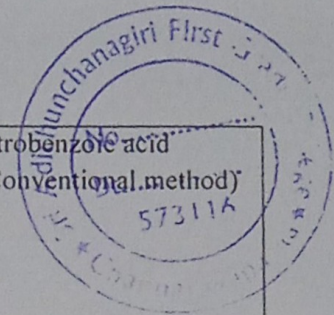
Part	Week	Theory		Practical	
		Lecture Day	Topic including Assignment/Test	Practical Day	Topic
A	1	1	Analytical chemistry Language of analytical chemistry: Definitions of analysis, determination, measurement	1	Preparation of standard sodium carbonate solution and standardization of hydrochloric acid solution (methyl orange indicator). Estimation of sodium hydroxide present in the solution using phenolphthalein
		2	Bohr's theory, its limitations and atomic spectrum of hydrogen atom		
		3	Classification and nomenclature of organic compounds, Hybridization, Shapes of organic molecules,		



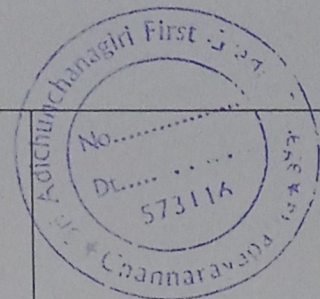
		4	Gaseous State Elementary aspects of kinetic theory of gasses, Ideal and real gasses. Boyle temperature (derivation not required)		indicator.
A	2	5	Techniques and methods. Classification of analytical techniques. Choice of an analytical method	2	Determination of carbonate and hydroxide present in a mixture.
		6	Wave mechanics: de Broglie equation		
		7	Influence of hybridization on bond properties. Nature of bonding in Organic molecules		
		8	Gaseous State Elementary aspects of kinetic theory of gases, Ideal and real gases. Boyle temperature (derivation not required)		
A	3	9	Accuracy, precision, sensitivity, selectivity, method validation. Figures of merit of analytical methods and limit of detection (LOD)	3	Determination of oxalic acid and sodium oxalate in a given mixture using standard KMnO ₄ /NaOH solution
		10	Heisenberg's Uncertainty Principle		
		11	Formation of Covalent bond, Types of chemical bonding, localized and delocalized, conjugation and cross conjugation, concept of resonance,		
		12	calculation of σ and η , variation of viscosity with temperature and pressure.		
A	4	13	Limit of quantification (LOQ), linear dynamic range (working range).		Estimation of ferrous and ferric iron in a given mixture using standard potassium
		14	Uncertainty Principle and its significance		

		15	Electronic displacements: Inductive effect, Electromeric effect, Resonance and Hyper conjugation, cross conjugation explanation with examples. Concept of resonance, aromaticity	4	dichromate solution.
		16	Maxwell's Boltzmann distribution law of molecular velocities (Most probable, average and root mean square velocities).		
A	5	17	Errors and treatment of analytical data: Limitations of analytical methods	5	Preparation of standard oxalic acid solution and standardization of potassium permanganate solution. Estimation of hydrogen peroxide present in the solution.
		18	Wave equation,		
		19	Huckel rule, anti-aromaticity explanation with examples. Strengths of Organic acid and bases: Comparative study with emphasis on factors effecting pK values.		
		20	Relation between RMS, average and most probable velocity and average kinetic energies. (Mathematical derivation not required), law of equipartition of energy		
A	6	21	Errors: Determinate and indeterminate errors, absolute error, relative error, minimization of errors	6	Preparation of standard oxalic acid solution and standardization of potassium permanganate solution. Estimation of ferrous ammonium sulphate present in the solution
		22	Schrödinger's wave equation,		
		23	Relative strength of aliphatic and aromatic carboxylic acids-Acetic acid and chloroacetic acid, acetic acid and propionic acid, acetic acid and Benzoic acid		
		24	Behaviour of real gases: Deviation from ideal gas behaviour. Compressibility factor (Z) and its variation with pressure for different gases		
		25	Statistical treatment of finite samples - mean, median, range, standard deviation and variance		

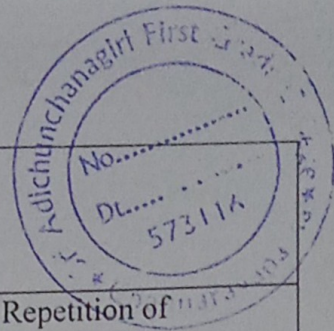
A	7	26	Significance of ψ and ψ^2	7	Preparation of acetanilide from aniline using Zn/acetic acid (Green method).
		27	Steric effect- Relative stability of trans and cis-2-butene		
		28	Causes of deviation from ideal behaviour, vander Waals equation of state (No derivation) and application in explaining real gas behaviour.		
A	8	29	External standard calibration - regression equation (least squares method)	8	Synthesis of p-nitro acetanilide from acetanilide using nitrating mixture.
		30	Quantum numbers and their significance		
		31	Mechanisms of Organic Reactions Notations used to represent electron movements and directions of reactions- curly arrows, formal charges.		
		32	Critical phenomena - Andrews isotherms of CO ₂ , critical constants and their calculation from van der Waals equation		
A	9	33	Correlation coefficient (R^2). Numerical problems Basic laboratory practices, calibration of glassware.	9	Bromination of acetanilide
		34	Normalized and orthogonal wave functions		
		35	Types of bonds breaking- Homolytic and Heterolytic. Types of reagents- Electrophiles, nucleophiles, nucleophilicity and basicity. Types of organic reactions- substitution, addition, elimination,		
		36	Continuity of states, Law of corresponding states. Numerical problems.		
		37	(pipette, burette and volumetric flask), Sampling (solids and liquids)		Hydrolysis of methyl m-nitrobenzoate to m-



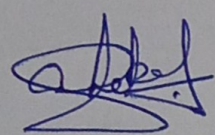
A	10	38	Sign of wave functions, Radial and angular wave functions for hydrogen atom	10	nitrobenzoic acid (Conventional method) 57311A
		39	Rearrangement and pericyclic reactions, explanation with examples. Chemistry of Aliphatic hydrocarbons, Carbon-Carbon Sigma bonds. Chemistry of alkanes: Formation of alkanes, Wurtz reaction, Wurtz-Fittig reaction, Free radical substitution,		
		40	Surface Tension: Definition and its determination using stalagmometer, effect of temperature and solute on surface tension		
A	11	41	Weighing, drying, dissolving, Acid treatment, Rules of work in analytical laboratory	11	Synthesis of diazoaminobenzene from aniline (conventional method)
		42	Radial and angular distribution curves, Shapes of s, p, d and f orbitals		
		43	Halogenation- relative reactivity and selectivity. Carbon-carbon pi bonds Formation of alkenes and alkynes by elimination reaction. Mechanism of E1, E2, E1cb reaction. Saytzeff and Hofmann eliminations		
		44	Viscosity: Definition, Coefficient of viscosity. Determination of viscosity of a liquid using Oswald viscometer. Effect of temperature, size, weight, shape of molecules and intermolecular forces.		
A	12	45	General rule for performing quantitative determinations (volumetric and gravimetric)	12	Preparation of dibenzalacetone (Green method)
		46	Pauli's Exclusion Principle, Hund's rule of maximum multiplicity, Aufbau's principle and its limitations		

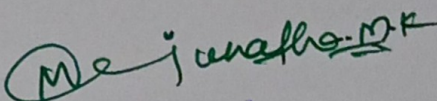


		47	Addition of HBr to propene, Free radical addition of HBr to propene. Addition of halogens to alkenes-carbocation and halonium ion mechanism. Stereospecificity of halogen addition.		
		48	Refraction: Specific and molar refraction- definition and advantages. Determination of refractive index by Abbes Refractometer. Additive and constitutive properties.		
A	13	49	Safety in Chemical laboratory, Rules of fire prevention and accidents, First aid	13	Practical Test: Part - 1
		50	Electronic configurations of the elements (Z=1-30), effective nuclear charge, shielding/screening effect		
		51	Ozonolysis mechanism - ozonolysis of propene. Addition of hydrogen halides to alkenes, mechanism, regioselectivity and relative rates of addition. Hydrogenation, hydration, hydroxylation and epoxidation of alkenes, explanation with examples, 1,2 and 1,4- addition reactions in conjugated dienes		
		52	Parachor: Definition, Atomic and structure parachor, Elucidation of structure of benzene and benzoquinone.		
A	14	53	Precautions to be taken while handling toxic chemicals, concentrated/fuming acids and organic solvents	14	Practical Test: Part - 2
		54	Electronic configurations of the elements (Z=1-30), effective nuclear charge, shielding/screening effect		
		55	Diels-Alder reaction, Allylic and benzylic bromination and mechanism in propene, 1-butene, 1-toluene and ethylbenzene.		

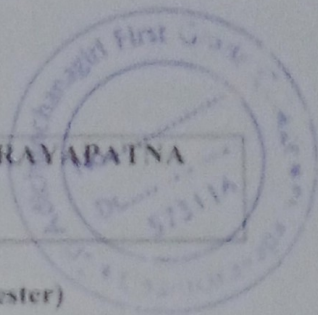


	56	Parachor: Definition, Atomic and structure parachor, Elucidation of structure of benzene and benzoquinone.	
B	57	Revision of syllabus.	15
	58	Revision of syllabus.	
	59	Revision of syllabus.	
	60	Revision of syllabus.	
			Repetition of experiments


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SRI ADICHUNCHANAGIRI FIRST GRADE COLLEGE, CHANNARAYAPATNA
DEPARTMENT OF CHEMISTRY
B.Sc. Second Semester (NEP)



LESSON PLAN FOR THE SESSION 2022-2023 (Even Semester)

Name of the Faculty : Dr. N Shankarasha, Dr B N Chandrashekar, Mrs. Premakumari.A.C. Miss. Apoorva (Theory and Practical)

Semester : 2nd

Title of the Paper : CHEMISTRY –II (DSC-2)

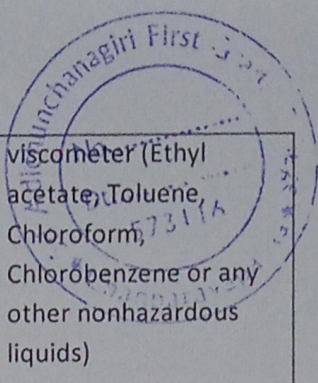
Subject code : CHEDSC201

Lesson Plan Duration : 16 weeks

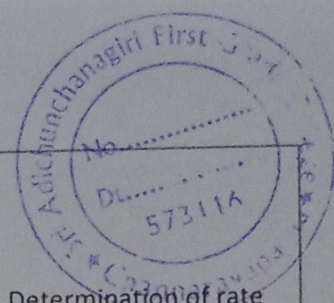
Total teaching period : 56 Hrs

Work Load (Lecture/Practical) Per Week (in hours): Lecture - 04, Practical – 04

Part	Week	Theory		Practical	
		Lecture Day	Topic including Assignment/Test	Practical Day	Topic
A	1	1	Analytical Chemistry Titrimetric analysis: Basic principle of titrimetric analysis. Classification, Preparation and dilution of reagents/solutions	1	Determination of density using specific gravity bottle and viscosity of liquids using Ostwald's
		2	s, p, d and f-block elements,.		
		3	Nucleophilic substitution at saturated carbon		

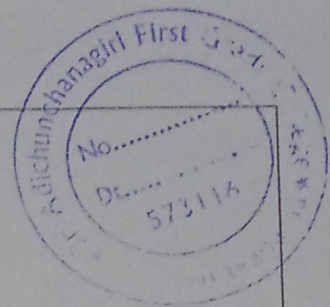


		4	Liquid Crystals Explanation, classification with examples- Smetic, nematic, cholesteric, discs shaped and polymeric.		viscometer (Ethyl acetate, Toluene, Chloroform, Chlorobenzene or any other nonhazardous liquids)
A	2	5	Normality, Molarity and Mole fraction. Use of $N_1V_1 = N_2V_2$ formula,	2	Determination of the density using specific gravity bottle and surface tension of liquids using Stalagmometer (Ethyl acetate, Toluene, Chlorobenzene, any other non-hazardous liquids.
		6	The long form of periodic table.		
		7	Mechanism of SN1 reactions with suitable 18 examples		
		8	Structures of nematic and cholesteric phases-molecular arrangements in nematic and cholesteric liquid crystals.		
A	3	9	Preparation of ppm level solutions from source materials (salts), conversion factors	3	Determination of the composition of liquid mixture by refractometry. (Toluene & Alcohol, Water & Sucrose)
		10	Detailed discussion of the following properties of the s-block elements		
		11	Mechanism of SN2 reactions with suitable 18 examples		
		12	Applications of liquid crystals in LCDs and thermal sensing.		
A	4	13	Acid-base titrimetry: Titration curves for strong acid vs strong base, weak acid vs strong base and weak base vs strong acid titrations.	4	Determination of partition/distribution coefficient - i) Acetic acid in water and cyclohexane. ii) Acetic acid in Water and Butanol. iii) Benzoic acid in water and toluene
		14	Detailed discussion of the following properties of the p-block elements		
		15	Energy profile diagrams		
		16	Applications of liquid crystals in LCDs and thermal sensing.		

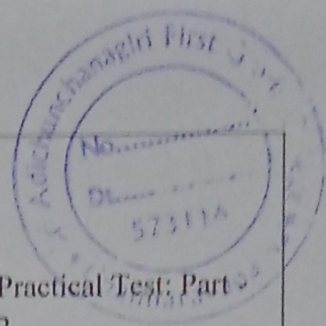


A	5	17	Titration curves, Quantitative applications – selecting and standardizing a titrant, inorganic analysis - alkalinity, acidity	5	Determination of rate constant of decomposition of H ₂ O ₂ catalyzed by FeCl ₃
		18	Atomic radii (van der Waals)		
		19	Stereochemistry and factors effecting SN ₁ reactions.		
		20	Laws of Crystallography: Law of constancy of interfacial angles, Law of rational indices, Law of symmetry (Symmetry elements),		
A	6	21	Complexometric titrimetry: Indicators for EDTA titrations - theory of metal ion indicators, titration methods employing EDTA	6	Determination of percentage composition of NaCl solution by determining miscibility temperature of phenol-water system.
		22	Ionic and crystal radii.		
		23	Stereochemistry and factors effecting SN ₂ reactions.		
		24	Laws of Crystallography: Law of constancy of interfacial angles, Law of rational indices, Law of symmetry (Symmetry elements),		
A	7	25	direct, back, displacement and indirect determinations, Applicationdetermination of hardness of water	7	Determination of percentage composition of NaCl solution by determining miscibility temperature of phenol-water system.
		26	Covalent radii		
		27	Aromatic Electrophilic substitution reactions		
		28	Miller indices and its calculation,		

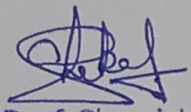
A	8	29	Redox titrimetry: Balancing redox equations, calculation of the equilibrium constant of redox reactions,	8	Determination of iron(II) using potassium dichromate; 73116
		30	Ionization enthalpy, successive ionization enthalpies and factors affecting ionization		
		31	Mechanisms of Electrophilic substitution reactions,		
		32	, X-Ray diffraction by crystals: Bragg's law and derivation of Bragg's equation		
A	9	33	titration curves, Theory of redox indicators, calculation of standard potentials using Nernst equation. Applications.	9	Determination of oxalic acid using standard potassium permanganate solution
		34	Applications of ionization enthalpy		
		35	σ and π complexes		
		36	Single crystal and powder diffraction methods		
A	10	37	Precipitation titrimetry: Titration curves, titrants and standards, indicators for precipitation titrations	10	Determination of hardness of water Standardized EDTA solution
		38	Electron gain enthalpy, trends of electron gain enthalpy		
		39	Halogenation, Nitration,		
		40	Single crystal and powder diffraction methods		
A	11	41	Precipitation titrations involving silver nitrate- Volhard's and Mohr's methods and their differences.		Determination of hardness of water Standardized EDTA solution
		42	Electronegativity, Pauling's/ Mulliken's/ Allred Rachow's/ and Mulliken-Jaffé's		

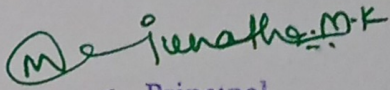


		43	Halogenation, Nitration	11	
		44	Distribution Law Nernst Distribution Law - Statement and its derivation. Distribution constant, factors affecting distribution constant		
A	12	45	Gravimetric Analysis: Requisites of precipitation, mechanism of precipitation, Factors influencing	12	Determination of hardness of water Standardized EDTA solution
		46	Electronegativity scales. Variation of electronegativity with bond order, partial charge, hybridization, group electronegativity		
		47	Acylation with their mechanism		
		48	validity of Distribution Law, Modification of distribution law when molecules undergo a) Association b) Dissociation		
A	13	49	Precipitation, Co-precipitation, post- precipitation, Advantages of organic reagents over inorganic reagents,	13	Practical Test: Part - 1
		50	Activating and deactivating groups. Orientation influence, Ortho-para ratio.		
		51	Ozonolysis mechanism - ozonolysis of propene. Addition of hydrogen halides to alkenes, mechanism, regioselectivity and relative rates of addition. Hydrogenation, hydration, hydroxylation and epoxidation of alkenes, explanation with examples, 1,2 and 1,4- addition reactions in conjugated dienes		
		52	Application of Distribution Law in Solvent extraction. Derivation for simple and multiple extraction.		

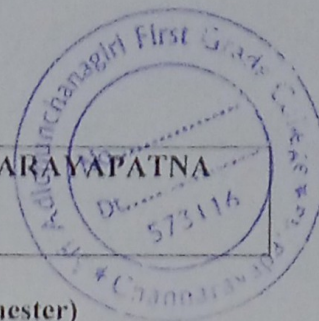


A	14	53	Reagents used in gravimetry (8-hydroxy quinoline (oxine) and dimethyl glyoxime (DMG). Numerical problems on all the above aspects.	14	Practical Test: Part 2
		54	Trends in the chemistry of the compounds of groups 13 to 17 (oxides and halides)		
		55	Aromatic nucleophilic substitution reaction: S _N Ar and Benzyne mechanism with suitable examples		
		56	Principles of distribution law in Parkes Process of desilverisation of lead. Numerical Problems.		
B		57	Revision of syllabus.	15	Repetition of experiments
		58	Revision of syllabus.		
		59	Revision of syllabus.		
		60	Revision of syllabus.		


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SRI ADICHUNCHANAGIRI FIRST GRADE COLLEGE, CHANNARAIPATNA
DEPARTMENT OF CHEMISTRY
B.Sc. Third Semester ((NEP)



LESSON PLAN FOR THE SESSION 2022-2023 (Odd Semester)

Name of the Faculty : Dr. N Shankarash, Dr. B.N. Chandrashekar, Mrs. Premakumari.
 Mrs. A.C, Apoorva
 (Theory and Practical)

Semester : 3rd

Title of the Paper : CHEMISTRY –III (DSC-3C)

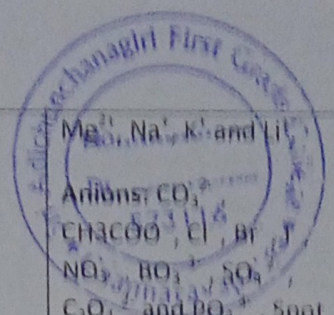
Subject code : CHEDSCP301

Lesson Plan Duration : 16 weeks

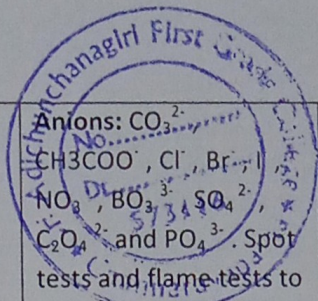
Total teaching period : 56 Hrs

Work Load (Lecture/Practical) Per Week (in hours): Lecture - 04, Practical – 04

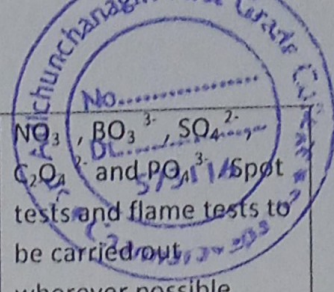
Part	Week	Theory		Practical	
		Lecture Day	Topic including Assignment/Test	Practical Day	Topic
		1	Separation methods: Fundamentals of chromatography: General description, definition, terms and parameters used in chromatography, classification of chromatographic methods		Qualitative semi-micro analysis of mixtures containing 2 anions and 2 cations
		2	Structure and Bonding-I: The ionic bond: Structures of ionic solids. Radius ratio rules	1	Cations: NH_4^+ , Pb^{2+} , Bi^{3+} , Cu^{2+} , Al^{3+} , Fe^{3+} , Co^{2+} , Cr^{3+} , Ni^{2+} , Zn^{2+} , Mn^{2+} , Ba^{2+} , Ca^{2+} , Sr^{2+} ,



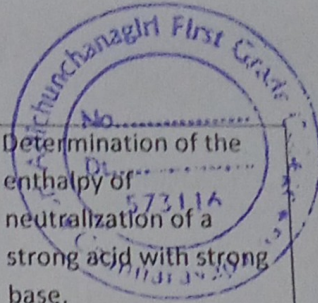
A	1	3	Reaction Intermediates: Generation, structure, stability and reactions involving; i. Carbocations: Dienone-phenol and Pinacol-Pinacolone Rearrangement.		Cations: Mg^{2+} , Na^+ , K^+ and Li^+ Anions: CO_3^{2-} , CH_3COO^- , Cl^- , Br^- , NO_3^- , BO_3^{3-} , SO_4^{2-} , $C_2O_4^{2-}$ and PO_4^{3-} . Spot tests and flame tests to be carried out wherever possible.
		4	Chemical Kinetics: Introduction, rate of reaction, order and molecularity with examples. Rate constant-definition and explanation.		
A	2	5	Criteria for selection of stationary and mobile phase and nature of adsorbents. Principles of paper, thin layer, column chromatography	2	Qualitative semi-micro analysis of mixtures containing 2 anions and 2 cations Cations: NH_4^+ , Pb^{2+} , Bi^{3+} , Cu^{2+} , Al^{3+} , Fe^{3+} , Co^{2+} , Cr^{3+} , Ni^{2+} , Zn^{2+} , Mn^{2+} , Ba^{2+} , Ca^{2+} , Sr^{2+} , Mg^{2+} , Na^+ , K^+ and Li^+ . Anions: CO_3^{2-} , CH_3COO^- , Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-} , SO_4^{2-} , $C_2O_4^{2-}$ and PO_4^{3-} . Spot tests and flame tests to be carried out wherever possible.
		6	Calculation of some limiting radius ratio values, Coordination number 3 (planar triangle)		
		7	Carbanions: Perkin Reaction, Aldol condensation, Claisen-Schmitt condensation.		
		8	Differential and integrated form of rate expressions up to second order reactions, Derivation of expression of rate constant of second order reaction ($a=b$ and $a \neq b$),		
A	3	9	Column efficiency, factors affecting the column efficiency, van Deemter's equation and its modern version.	3	Qualitative semi-micro analysis of mixtures containing 2 anions and 2 cations Cations: NH_4^+ , Pb^{2+} , Bi^{3+} , Cu^{2+} , Al^{3+} , Fe^{3+} , Co^{2+} , Cr^{3+} , Ni^{2+} , Zn^{2+} , Mn^{2+} , Ba^{2+} , Ca^{2+} , Sr^{2+} , Mg^{2+} , Na^+ , K^+ and Li^+ .
		10	Calculation of some limiting radius ratio values, Coordination number 3 (planar triangle)		
		11	Carbanions: Perkin Reaction, Aldol condensation, Claisen-Schmitt condensation.		



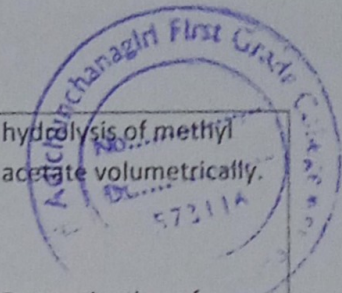
		12	Problems on rate constant ($a=b$), Methods of determination of order of a reaction (half-life method, isolation method),		Anions: CO_3^{2-} , CH_3COO^- , Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-} , SO_4^{2-} , $\text{C}_2\text{O}_4^{2-}$ and PO_4^{3-} . Spot tests and flame tests to be carried out wherever possible.
A	4	13	Paper chromatography: Theory and applications	4	Qualitative semi-micro analysis of mixtures containing 2 anions and 2 cations Cations: NH_4^+ , Pb^{2+} , Bi^{3+} , Cu^{2+} , Al^{3+} , Fe^{3+} , Co^{2+} , Cr^{3+} , Ni^{2+} , Zn^{2+} , Mn^{2+} , Ba^{2+} , Ca^{2+} , Sr^{2+} , Mg^{2+} , Na^+ , K^+ and Li^+ . Anions: CO_3^{2-} , CH_3COO^- , Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-} , SO_4^{2-} , $\text{C}_2\text{O}_4^{2-}$ and PO_4^{3-} . Spot tests and flame tests to be carried out wherever possible.
		14	Classification of ionic structures: Ionic compounds of the type AX (ZnS , NaCl , CsCl), ionic compounds of the type AX ₂		
		15	Carbenes: Singlet and triplet states, their relative stability. Riemer-Tieman,		
		16	temperature dependence of reaction rates; Arrhenius equation, activation energy,		
A	5	17	Thin layer chromatography (TLC): Mechanism, R _f value, efficiency of TLC plates	5	Qualitative semi-micro analysis of mixtures containing 2 anions and 2 cations Cations: NH_4^+ , Pb^{2+} , Bi^{3+} , Cu^{2+} , Al^{3+} , Fe^{3+} , Co^{2+} , Cr^{3+} , Ni^{2+} , Zn^{2+} , Mn^{2+} , Ba^{2+} , Ca^{2+} , Sr^{2+} , Mg^{2+} , Na^+ , K^+ and Li^+ . Anions: CO_3^{2-} , CH_3COO^- , Cl^- , Br^- , I^- ,
		18	Classification of ionic structures: Ionic compounds of the type AX (ZnS , NaCl , CsCl), ionic compounds of the type AX ₂		
		19	Carbenes: Wolff rearrangement. Nitrenes: Singlet and triplet states, their relative stability		



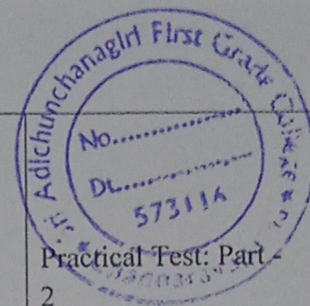
		20	Numerical problems on Arrhenius equation in calculating energy of activation and rate constants. Collision theory of reaction rates,		NO_3^- , BO_3^{3-} , SO_4^{2-} , $\text{C}_2\text{O}_4^{2-}$ and PO_4^{3-} . Spot tests and flame tests to be carried out wherever possible.
A	6	21	TLC: Methodology–selection of stationary and mobile phases, development,	6	Qualitative semi-micro analysis of mixtures containing 2 anions and 2 cations Cations: NH_4^+ , Pb^{2+} , Bi^{3+} , Cu^{2+} , Al^{3+} , Fe^{3+} , Co^{2+} , Cr^{3+} , Ni^{2+} , Zn^{2+} , Mn^{2+} , Ba^{2+} , Ca^{2+} , Sr^{2+} , Mg^{2+} , Na^+ , K^+ and Li^+ . Anions: CO_3^{2-} , CH_3COO^- , Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-} , SO_4^{2-} , $\text{C}_2\text{O}_4^{2-}$ and PO_4^{3-} . Spot tests and flame tests to be carried out wherever possible.
		22	Lattice energy and Born-Haber cycle		
		23	Nitrenes: Hoffman and Curtius reactions.		
		24	Lindemann's mechanism, qualitative treatment of the theory of absolute reaction rates. Experimental determination of kinetics of (i) inversion of cane sugar by polarimetric method		
A	7	25	TLC: Spray reagents, identification and detection, qualitative applications.	7	Qualitative semi-micro analysis of mixtures containing 2 anions and 2 cations Cations: NH_4^+ , Pb^{2+} , Bi^{3+} , Cu^{2+} , Al^{3+} , Fe^{3+} , Co^{2+} , Cr^{3+} , Ni^{2+} , Zn^{2+} , Mn^{2+} , Ba^{2+} , Ca^{2+} , Sr^{2+} , Mg^{2+} , Na^+ , K^+ and Li^+ . Anions: CO_3^{2-} , CH_3COO^- , Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-} , SO_4^{2-} , $\text{C}_2\text{O}_4^{2-}$ and PO_4^{3-} . Spot tests and flame tests to be carried out wherever possible.
		26	Derivation of Born-Landé equation and its drawbacks,		
		27	Arynes: Formation, detection. Bromobenzene to aniline, (4+2) cycloaddition reaction.		
		28	(ii) spectrophotometric method for the reaction between potassium persulphate and potassium iodide.		

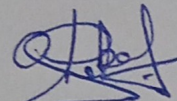


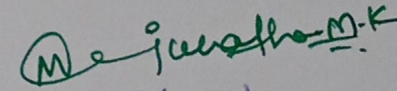
A	8	29	TLC: Solvent Extraction: Types - batch, continuous, efficiency, selectivity,	8	Determination of the enthalpy of neutralization of a strong acid with strong base.
		30	Kapustinskii equation, solvation energy and solubility of ionic solids,		
		31	Reaction Intermediates: Generation, structure, stability and reactions involving; i. Carbocations to ARYNES		
		32	Electrochemistry – I: Introduction, strong and weak electrolytes, definition with examples.		
A	9	33	TLC: distribution coefficient, Nernst distribution law, derivation,	9	Verification of Freundlich and Langmuir isotherms for adsorption of acetic acid on activated charcoal.
		34	polarizing power and polarizability		
		35	Methods for Identifying Reaction Mechanism:		
		36	Arrhenius theory of electrolytic dissociation. Merits and Demerits, Conductance, Specific conductance,		
A	10	37	TLC: factors affecting the partition, relationship between % extraction and volume fraction,	10	The study of kinetics of potassium persulphate and potassium iodide volumetrically.
		38	Fajan's rules with applications. Numerical problems		
		39	Product analysis,		
		40	equivalent and molar conductivity and their variation with dilution. Molar conductivity at infinite dilution. Numerical problems.		
		41	TLC:Numerical problems on solvent extraction. Solvent extraction of iron and copper.		Determination of velocity constant for acid catalyzed

A	11	42	Covalent bond: Valence bond theory, The Lewis theory, The octet rule, Exceptions to the octet rule, Sidgwick-Powell theory	11	 hydrolysis of methyl acetate volumetrically.
		43	Isolation and Identification of Intermediates		
		44	Kohlrausch's law of independent migration of ions and its applications, Debye-Hückel Onsager equation.		
A	12	45	Ion exchange chromatography: resins, types with examples- cation exchange and anion exchange resins	12	Conductometric titration of strong acid and strong base. Conductometric titration of weak acid and strong base.
		46	Valence shell electron pair repulsion (VSEPR) theory, Effect of lone pairs, electronegativity		
		47	Stereochemical Evidences,		
		48	Ionic mobilities and their determinations, transference numbers and their relation to ionic mobility's, determination of transference numbers using Hittorf and Moving Boundary methods.		
A	13	49	Mechanism of cation and anion exchange process and applications of ion- exchange chromatography	13	Practical Test: Part - 1
		50	Isoelectronic principle, Examples using VSEPR theory: BF_3 and BF_4^- , NH_3 and NH_4^+ , H_2O , PCl_5 ,		
		51	Effect of Catalyst, crossover Experiments,		
		52	Applications of conductance measurement: (i) Degree of dissociation of weak electrolytes (ii) ionic product of water		

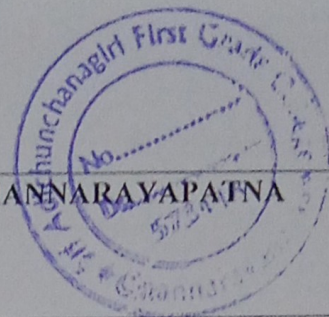
A	14	53	Softening of hard water, separation of lanthanides, industrial applications	14	Practical Test: Part - 2
		54	VSEPR theory: ClF_3 , SF_4 , IO_3^- and IO_3^+ , SF_6 , and IF_7 . Limitations of VSEPR.		
		55	Isotopic studies, Kinetic Studies.		
		56	Applications of conductance measurement: (i) Degree of dissociation of weak electrolytes (ii) ionic product of water		
B		57	Revision of syllabus.	15	Repetition of experiments
		58	Revision of syllabus.		
		59	Revision of syllabus.		
		60	Revision of syllabus.		




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SRI ADICHUNCHANAGIRI FIRST GRADE COLLEGE, CHANNARAYAPATNA
DEPARTMENT OF CHEMISTRY
B.Sc. Fourth Semester (NEP)



LESSON PLAN FOR THE SESSION 2022-2023 (Even Semester)

Name of the Faculty : Dr. N Shankarsha, Dr.B.N.Chandrashekar, Mrs. Premakumari.A.C, Miss. Apoorva (Theory and Practical)

Semester : 4th

Title of the Paper : **CHEMISTRY –IV**

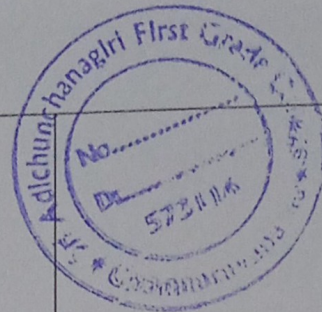
Subject code : **CHEDSC401**

Lesson Plan Duration : 16 weeks

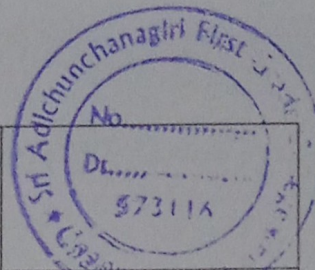
Total teaching period : **56 Hours**

Work Load (Lecture/Practical) Per Week (in hours): Lecture - 04, Practical – 04

Part	Week	Theory		Practical	
		Lecture Day	Topic including Assignment/Test	Practical Day	Topic
A	1	1	Quantitative analysis-Instrumental methods: Electromagnetic spectrum.	1	Qualitative analysis of mono Organic compounds: Urea
		2	Structure and Bonding -II: Concept of resonance, resonance energy,		
		3	Structure and Stereochemistry of Organic Compounds: Concept of isomerism, types of isomerism. Projection formulae of chiral molecules-Fischer (glyceric acid),		

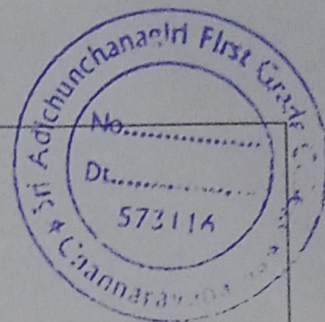


		4	First Law of Thermodynamics: Introduction, system, surroundings, types of systems. Thermodynamic Processes (isothermal, adiabatic, isochoric, isobaric and cyclic),		
A	2	5	absorption of electromagnetic radiation,	2	Qualitative analysis of mono and bifunctional Organic compounds: Benzoic acid
		6	hybridization, types of hybridization, sp, sp ² , sp ³ , dsp ² , dsp ³ , d ² sp ³ , sp ³ d ² with one example each		
		7	Newman (2,3-dibromobutane), Sawhorse (2,3-dibromobutane) and Fly-wedge (glyceric acid) projection formulae. Interconversion of projection formulae:		
		8	Nature of Heat and Work, Internal Energy, First Law of thermodynamics, Enthalpy of a System		
A	3	9	Definition and units of frequency, wavelength, wave number	3	Qualitative analysis of mono Organic compounds: Salicylic acid, aniline
		10	Energetics of hybridization. Bent's rule, Limitations of Valence Bond Theory. Molecular Orbital theory: LCAO concept: s-s, s-p, p-p, p-d and d-d combinations of orbitals, bonding		
		11	Conversion of; Fisher into Sawhorse projection (tartaric acid), Sawhorse into Fisher projection (2,3-dibromobutane), Sawhorse to Newman to Fisher projection (3-amino-3-bromo-2-chlorobutan-2-ol),		

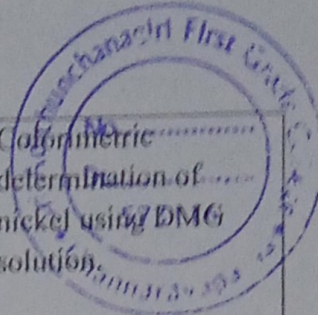


		12	Work done in isothermal and adiabatic expansion of an ideal gas, Numerical problems		
A	4	13	Beer's law, Beer-Lambert law derivation	5	Qualitative analysis of bifunctional Organic compounds Salicylaldehyde
		14	nonbonding and antibonding molecular orbitals		
		15	Fisher to Newman to Sawhorse (3-chloro-2,4-dihydroxybutanal), Fisher into Fly-wedge formula and vice-versa (2-bromo propanoic acid),		
		16	Joule-Thomson Expansion, Relation between Joule-Thomson coefficient and other thermodynamic parameters.		
A	5	17	deviations from Beer's law, limitations	5	Qualitative analysis of mono Organic compounds: acetanilide
		18	non-bonding combinations of orbitals, Rules for linear combination of atomic orbitals		
		19	Geometrical isomerism: Cause of geometrical isomerism. Cis-trans isomerism (cinnamic acid, but-2-enedioic acid) and syn-anti isomerism (benzaldoxime, ethyl methylketoxime),		
		20	Second law of Thermodynamics: Limitations of first law of thermodynamics. Reversible and Irreversible Processes,		
		21	construction of calibration graph (Plot of absorbance versus concentration)		Qualitative analysis of bifunctional Organic compounds Dichlorob

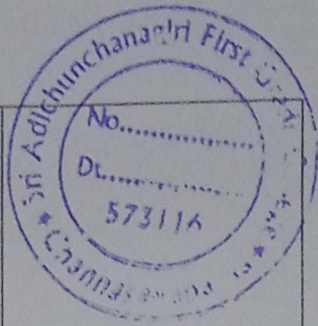
A	6	22	Examples of molecular orbital treatment for homonuclear diatomic molecules: H ₂ , molecule, H ₂ ⁺ molecule ion,	6	enzyme No..... Date..... 573116
		23	E/Z notations with examples following C.I.P rules.		
		24	Concept of entropy, thermodynamic scale of temperature, Statements of the Second Law of Thermodynamics,		
A	7	25	Evaluation, Procedures- standard addition	7	Qualitative analysis bifunctional Organic compounds : p-Nitro toluene
		26	He ₂ molecule, He ₂ ⁺ molecule ion, Li ₂ molecule, Be ₂ molecule, B ₂ molecule, C ₂ molecule, N ₂ molecule, N ₂ ⁺ molecule ion, O ₂ molecule, O ₂ ⁻ and O ₂ ²⁻ molecule ions.		
		27	Optical Isomerism: Optical activity, conditions for optical activity- Elements of symmetry(plane, centre, C ₂ -axis, rotation-reflection with examples).		
		28	molecular and statistical interpretation of entropy, Calculation of entropy change for reversible and irreversible processes		
A	8	29	Internal standard addition, validation parameters-detection limits, sensitivity, dynamic/linearity range	8	Qualitative analysis bifunctional Organic compounds : o-Cresol
		30	M.O. Energy diagrams of heteronuclear diatomic molecules with examples (NO, NO ⁺ , CO and HCl)		



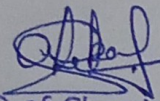
		31	Specific rotation, Chirality/Asymmetry, Enantiomers-definition with examples,		
		32	Free Energy Functions: Gibbs and Helmholtz energy		
A	9	33	Instrumentation, single beam and double beam spectrophotometers,	9	Colorimetric determination of copper using ammonia solution.
		34	Calculation of bond order, relationship between bond order, bond energy		
		35	properties, Molecules with two or more chiral centres,		
		36	variation of S, G, A with T, V and P, Numerical problems, Free energy change and spontaneity, Gibbs-Helmholtz equation.		
A	10	37	quantitative applications of colorimetry (determination of Fe, Mo, Cu, Ti and PO ₄ ³⁻) and numerical problems on application of Beer's law.	10	Colorimetric determination of iron using thiocyanate solution.
		38	bond length, magnetic properties based on MOT.		
		39	Diastereoisomers-definition with examples (threo and erythroisomers),		
		40	Third Law of Thermodynamics: Statement of third law, concept of residual entropy, calculation of absolute entropy of molecules.		

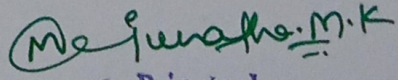


A	11	41	Nephelometry and Turbidimetry: Introduction, principle,	11	Colorimetric determination of nickel using DMG solution.
		42	Metallic Bonding: General properties of metals-conductivity, lustre, malleability and cohesive force.		
		43	properties. Meso compounds-definition with examples.		
		44	Surface Chemistry Adsorption: Introduction, types of adsorptions with examples. Types of adsorption isotherms. Freundlich adsorption isotherm (only equation),		
A	12	45	instrumentations of nephelometry and turbidimetry;	12	Determination of Rf values of two or three component systems by TLC.
		46	Crystal structures of metals and Bond lengths. Theories of bonding in metals:		
		47	optical isomerism in tartaric acid, biphenyls.		
		48	Limitations. Langmuir adsorption isotherm (derivation to be done) and BET equation (derivation not included).		
A	13	49	effects of concentration, particle size and wavelength on scattering;	13	Separation of different metal ions by paper chromatography/ Solvent extraction of iron using oxine solution (demonstration).
		50	Free electron theory, valence bond theory, molecular orbital or band theory of solids. Prediction of conducting properties of conductors,		
		51	Asymmetric synthesis, Walden inversion. Racemic modification- Definition with examples.		

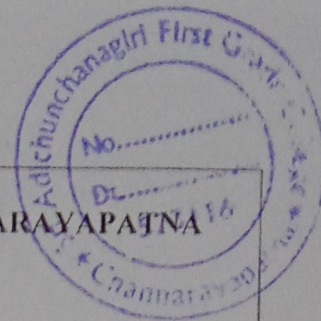


		52	Catalysis: Types of Catalysis positive, negative, auto and induced), characteristics of catalysis, and theories with examples (intermediate compound theory and adsorption theory), Theory of acid base catalysis, Michaelis-Menten mechanism.		
A	14	53	Choice between nephelometry, applications of nephelometry & turbidimetry (determination of SO ₄ ²⁻ and PO ₄ ³⁻).	14	Test
		54	Insulators and semiconductors, extrinsic and intrinsic semiconductors using M.O. theory.		
		55	Resolution-definition with examples, chemical and biochemical methods of resolution, Relative and absolute configuration, D/L convention, limitations, and R/S designations-CIP rules with examples.		
		56	Heterogeneous catalysis: surface reactions, unimolecular, bimolecular surface reactions. Autocatalysis with examples. Applications: Design process to removal of toxic compounds from industrial wastewater and treatment of portable water requirements.		
B		57	Revision of syllabus.	15	Repetition of experiments
		58	Revision of syllabus.		
		59	Revision of syllabus.		
		60	Revision of syllabus.		


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DEPARTMENT OF CHEMISTRY
B.Sc. Fifth Semester (CBCS)



LESSON PLAN FOR THE SESSION 2022-23 (Odd Semester)

Name of the Faculty : Dr. N Shankaresha, Dr B N. Chandrashekar,
Mrs.A.C.Premakumari Mrs.Apoorva (Theory and Practical)

Semester : V

Title of the Paper : CHEMISTRY –V (DSE-2A)

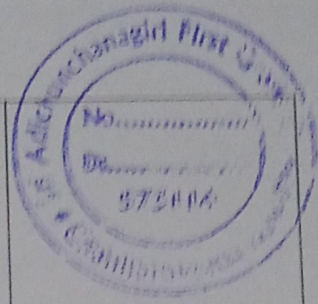
Subject code : (DSE-2A)

Lesson Plan Duration : 15 weeks

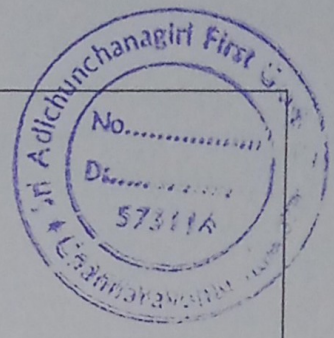
Total teaching period : 60 Hrs.

Work Load (Lecture/Practical) Per Week (in hours): Lecture - 04, Practical – 04

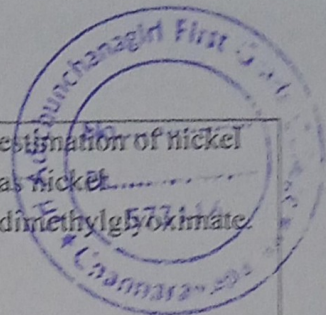
Part	Week	Theory		Practical	
		Lecture Day	Topic including Assignment/Test	Practical Day	Topic
	1	1	Silicate Industries Glass: Raw materials, glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass	1	Introduction to laboratory experiments.
		2	Terpenes: Definition, isoprene rule, classification, isolation (solvent extraction and steam distillation) structural elucidation of citral and its synthesis, structural formulae of α -terpeniol, camphor and menthol.		



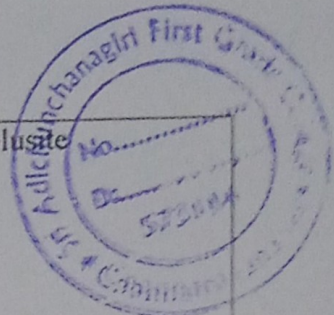
A	3	Spectrophotometry and photochemistry: Lambert – Beer’s law – statement and mathematical form (to be derived). Molar extinction coefficient – definition – spectrophotometer – construction and working, its application.		
	4	Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass,		
2	5	Laws of photochemistry – Grotthus-Draper law of photochemical activation and Einstein’s law of photochemical equivalence, quantum efficiency,	2	Gravimetric estimation of barium as barium sulphate
	6	safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.		
	7	indole (Fischer method) quinoline (Skrup’s synthesis with mechanism), isoquinoline, pyrimidine		
	8	aromaticity and basicity of pyrrole and pyridine. Electrophilic substitution reactions of pyrrole and pyridine.		
3	9	reasons for low quantum yield (HBr formation as example) and high quantum yield (HCl formation as example), actinometry – Uranyl oxalate actinometer.	3	Gravimetric estimation of iron as iron (III) oxide.
	10	Ceramics: Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications		



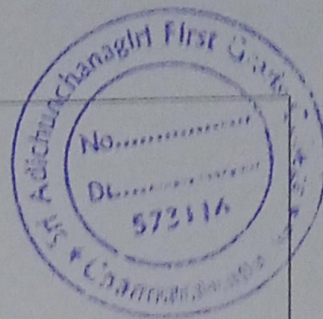
		11	Uric acid: Elucidation of structure and synthesis by Fischer's method	
		12	Photophysical processes: Definition with examples – photosensitization (eg. photosynthesis in plants), photo inhibition,	
		13	conversion of uric acid to purine and caffeine	
	4	14	superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre.	4
		15	Alkaloids: Definition, classification based on heterocyclic rings-isolation	
		16	fluorescence, phosphorescence, chemiluminescence and bioluminescence with examples.	
		17	Determination of absorbed intensity – schematic diagram of apparatus used.	
	5	18	synthesis and structural elucidation of nicotine	5
		19	Cement: Classification of cement, ingredients and their role	
		20	Manufacture of cement and the setting process, quick setting cement.	
		21	Morphine, physiological importance of alkaloids.	Gravimetric



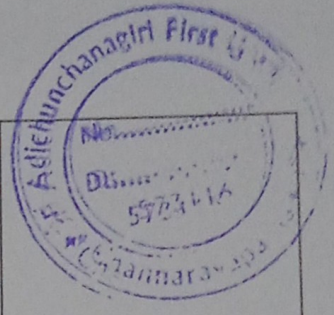
A	6	22	Vitamins: Definition, classification, structural elucidation and synthesis of Vit-A	6	estimation of nickel as nickel dimethylglyoximate.	
		23	Detectors – thermopile, photoelectric cell.			
		24	Synthesis of Vit-C, structural formulae of Vit B ₁			
	7	7	25	Fertilizers: Different types of fertilizers.	7	Gravimetric estimation of magnesium as magnesium -8- hydroxy oxinate
			26	Fertilizers: Different types of fertilizers: NPK		
			27	Manufacture of the following fertilizers: Urea		
			28	B ₂ , B ₆ , calciferol, E and K and their importance		
	8	8	29	Inorganic chemistry internals (C1)	8	Repetition of experiments
			30	Organic chemistry internals (C1)		
			31	Physical chemistry internals (C1)		
			32	General chemistry internals (C1)		
			33	Radiation Chemistry: Definition, primary and secondary stages in radiochemical reactions		Estimation of manganese in the given sample of



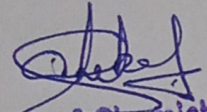
B	9	34	ammonium nitrate, calcium ammonium nitrate,	9	pyrolusite	
		35	Hormones: Definition, classification, synthesis of adrenaline			
		36	ionic yield, energy yield, comparison with photochemistry,			
	10	10	37	thyroxine, structural formulae of estradiol,	10	Preparation of standard potassium dichromate solution and estimation of iron in the given sample of hematite by dichromate method.
			38	ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers,		
			39	progesterone and testosterone and their importance		
			40	units of radiation – rad, gray and roentgen,		
	11	11	41	Dosimeter – Fricke dosimeter	11	Estimation of magnesium in the given sample of dolomite by EDTA method
			42	Drugs: Chemotherapy and chemotherapeutic agents, definition of drugs, types of drugs		
			43	Surface Coatings: Objectives of coatings surfaces, preliminary treatment of surface		
			44	classification of surface coatings. Paints and pigments- formulation, composition and related properties		
	12	12	45	antipyretics, analgesics, anesthetics, sedatives, narcotics	12	.Estimation of percentage of calcium in limestone by oxalate method.
46			theories of radiolysis – Lind's and EHT theories.			

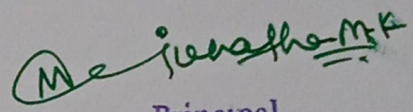


	47	Radiolysis of water vapour, benzene and acetic acid.	12	
	48	Molecular Spectroscopy: Regions of spectra, types of spectra, microwave spectra – rotational spectra of diatomic molecules		
13	49	Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers	13	Test
	50	antiseptics, antibacterials, antibiotics, antimalarials and sulpha drugs with examples.		
	51	moment of inertia (expression to be derived). Expression for rotational energy,		
	52	Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint),		
14	53	Dyes, Wax polishing, Water and Oil paints, additives; metal spraying and anodizing	14	Repetition of experiments
	54	Synthesis of paracetamol, sulphanilamide, sulphaguanidine. [
	55	selection rule and transition equal spacing between rotational spectral lines (to be discussed), effect of isotopic substitution taking example of $^{12}\text{C}^{16}\text{O}$ and $^{13}\text{C}^{16}\text{O}$, calculation of bond length.		

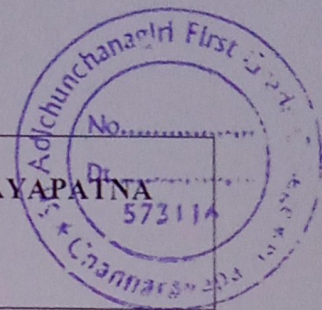


		56	. IR Spectra – vibrational spectra of diatomic molecules – force constant (no derivation), expression for vibrational energy, zero point energy, selection rule and transitions. Vibrational		
B	15	57	Revision of syllabus.	15	Practice lab
		58	Revision of syllabus.		
		59	Revision of syllabus.		
		60	Revision of syllabus.		


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DEPARTMENT OF CHEMISTRY
B.Sc. Fifth Semester (CBCS)



LESSON PLAN FOR THE SESSION 2022-23 (Odd Semester)

Name of the Faculty : Dr.B.N.Chandrashekar, Mrs. Apoorva (Theory and Practical)

Semester : V

Title of the Paper : SEC:2 FUEL CHEMISTRY

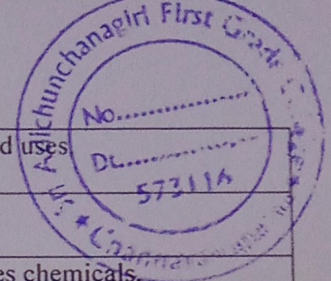
Subject code : DSE-2A

Lesson Plan Duration : 16 weeks

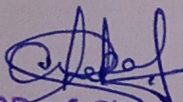
Total teaching period : 30 Hrs.

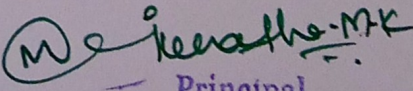
Work Load (Lecture/Practical) Per Week (in hours): Lecture - 02, Practical - 00

Part	Week	Theory	
		Lecture Day	Topic including Assignment/Test
A	1	1	Review of energy sources (renewable and non-renewable).
		2	Petroleum and Petrochemical Industry: Composition of crude petroleum
	2	3	Classification of fuels and their calorific value.
		4	Refining and different types of petroleum products
	3	5	Coal: Uses of coal (fuel and nonfuel) in various industries, its composition
		6	Refining and different types of petroleum products
4	7	Carbonization of coal. Coal gas,	
	8	Fractional Distillation (Principle and process)	

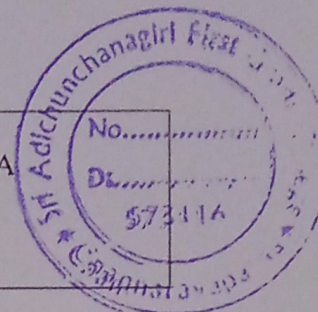


	5	9	producer gas and water gas—composition and uses
		10	Cracking (Thermal and catalytic cracking)
	6	11	Fractionation of coal tar, uses of coal tar bases chemicals,
		12	Reforming Petroleum and non-petroleum fuels- LPG
	7	13	requisites of a good metallurgical coke
		14	CNG, LNG
	8	15	Coal gasification - Hydro gasification
		16	bio-gas, fuels derived from biomass
B	9	17	Coal gasification - Catalytic gasification
		18	fuel from waste, synthetic fuels (gaseous and liquids)
	10	19	Coal liquefaction and Solvent Refining
		20	clean fuels
	11	21	Lubricants: Classification of lubricants, I
		22	Petrochemicals: Vinyl acetate
	12	23	lubricating oils (conducting and non-conducting)
		24	Propylene oxide, Isoprene
	13	25	Solid and semisolid lubricants,
		26	Butadiene, Toluene
	14	27	Properties of lubricants (viscosity index, cloud point, pore point) and their determination.
		28	Toluene and its derivatives Xylene
	15	29	Revision of syllabus.
		30	Revision of syllabus.


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 DEPARTMENT OF CHEMISTRY
 B.Sc. Sixth Semester (CBCS)



LESSON PLAN FOR THE SESSION 2022-23 (Odd Semester)

Name of the Faculty :Dr. N Shankaresha, Dr B N Chandrashekar, Mrs. A.C. Premakumari, Miss. Apoorva (Theory and Practical)

Semester :VI

Title of the Paper :CHEMISTRY –VI (DSC-2B)

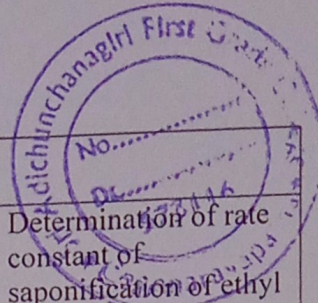
Subject code :F19

Lesson Plan Duration :16 weeks (from April , 2023 to Aug, 2023)

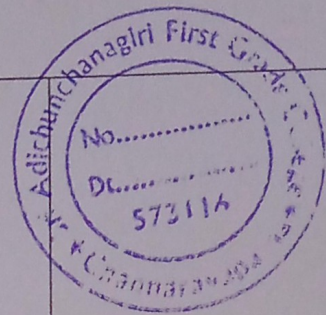
Total teaching period :60 Hrs.

Work Load (Lecture/Practical) Per Week (in hours): Lecture - 04, Practical – 04

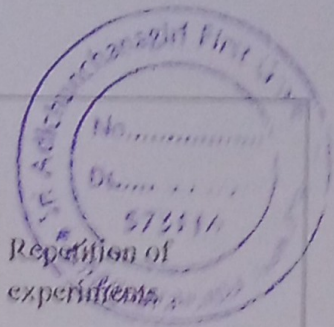
Part	Week	Theory		Practical	
		Lecture Day	Topic including Assignment/Test	Practical Day	Topic
	1	1	Metallurgy: Chief modes of occurrence of metals based on standard electrode potentials	1	Introduction to laboratory experiments.
		2	Ellingham diagrams for reduction of metal oxides using carbon as reducing agent.		
		3	Special techniques in organic synthesis: a) Polymer supported reagents – introduction, properties of polymer support-advantages of polymer support reagents		
		4	choice of polymers, types and		



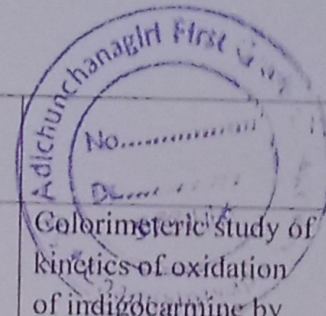
A	2	5	applications Electrochemistry Electrolytic and electrochemical cells, electrode reaction of Daniel cell	2	Determination of rate constant of saponification of ethyl acetate by conductivity measurements.	
		6	Pyrometallurgy: Extraction of Nickel from sulphide ore – general metallurgy followed by Mond’s process (purification)			
		7	c) Microwave induced organic synthesis – introduction, reaction vessel			
		8	convention of representing a cell, EMF and standard EMF of a cell, cell reaction			
	3		9	Manganese from oxide ores – reduction by the Aluminothermite process – refining by electrolytic process.	3	Conductometric titration of strong acid x strong base and weak acid x strong base.
			10	EMF and standard EMF of a cell, cell reaction, Adsorption: Adsorption of gases on solids – factors which influence. Adsorption isotherms (definition) – Freundlich’s and Langmuir’s adsorption isotherms		
			11	d) Sonochemistry – use of ultra sound in organic synthesis,		
			12	Introduction, instrumentation, physical aspects, types and applications.		
	4		13	Hydrometallurgy: Extraction of gold from native ore by cyanide process. Refining by quartation process.	4	Potentiometric titration of ferrous ammonium sulphate against potassium dichromate
			14	Natural Pigments: Introduction to anthocyanines.		



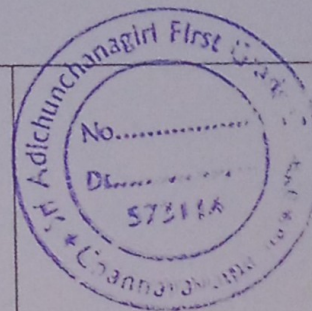
A		15	structural formulae and their importance of anthocyanins			
		16	reversible and irreversible cells, BET equation (to be derived). Applications of adsorption.			
	5		17	Nernst equation (to be derived) and calculation of electrode potential	5	pH titration of strong acid against strong base (by observing change in pH).
			18	β -carotene and haemoglobin		
			19	Electrometallurgy: Extraction of lithium by fusion method followed by electrolysis of lithium chloride.		
			20	Powder metallurgy: Importance, and applications. production of tungsten powder		
	6		21	Diazonium Compounds: preparation, mechanism of preparation	6	Potentiometric titration of mixture of HCl and CH_3COOH using NaOH solution
			22	synthetic applications of benzene diazonium chloride		
			23	Standard hydrogen gas electrode		
			24	Electrochemical series and its significance.		
	7		25	Conversion to phenol, halobenzene, phenyl hydrazine.	7	Colorimetric estimation of Fe^{3+} ion using ammonium thiocyanate as complexing agent
			26	Coupling reaction.		
27			reference electrodes-calomel and Ag-AgCl electrode-construction and working			
28			Hydroxy acids: Synthesis of lactic, citric and tartaric acids.			



8	29	Inorganic chemistry internals (C1)	8	Repetition of experiments
	30	Organic chemistry internals (C1)		
	31	Physical chemistry internals (C1)		
	32	Discussion and solving the internals test papers		
9	33	One method each and their importance. Effect of heat on α , β , γ -hydroxy acids.	9	Colorimetric estimation of Cu^{2+} ion using NH_4OH as complexing agent.
	34	Alloys: Classification of alloys, ferrous and non-ferrous alloys,		
	35	Principles of electroplating. Specific properties of elements in alloys		
	36	Nucleic acids: Types, components, formation of nucleic acids		
10	37	Bio-Inorganic Chemistry A brief introduction to bio-inorganic chemistry	10	
	38	equilibrium constant and free energy of cell reaction		
	39	Spontaneity of a cell reaction, concentration cells.		
	40	EMF of concentration cells: Definition with explanation – with		

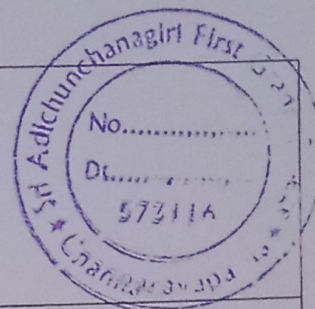


B			transference and without transference		
	11	41	Structure of DNA and RNA	11	Colorimetric study of kinetics of oxidation of indigo carmine by chloramine-T.
		42	Importance of these in biological system		
		43	Identification of organic compounds by spectroscopic technique: UV-visible spectroscopy: Introduction, chromophores and auxochrome, blue shift and red shift,		
		44	Essential and trace elements in biological process.		
	12	45	Role of metal ions present in biological systems with special reference to Na ⁺ , K ⁺ and Ca ²⁺ , Mg ²⁺ ions	12	
		46	Na/K pump; Role of Mg ²⁺ ions in energy production and chlorophyll.		
		47	Graphical representation of spectra of 1,3-butadiene, benzene and lycopene		
		48	Influence of conjugation on UV absorption-comparison of UV spectra of acetone and methylvinyl ketone		
	13	49	Concentration cells – with examples. Liquid junction potential and salt bridge. (Numerical problems on Nernst equation and EMF calculations).	13	Test
		50	Application of EMF measurements: (a) Determination of pH of a solution using quinhydrone electrode and glass electrode (using dip type Calomel electrode) – Explanation with principle and procedure		



	51	b) Potentiometric titration – principle, location of end points in - (1) Neutralization reactions [NaOHVsHCl] (2) Oxidation-reduction reactions [K ₂ Cr ₂ O ₇ Vs FAS] (3) Precipitation reaction [KClVs AgNO ₃] and (4) Complexometric reactions (ZnSO ₄ Vs K ₃ [Fe(CN) ₆])		
	52	IR-Spectroscopy: Introduction, stretching frequency of –OH (free and H-bonded), alkyl –C-H, C=C, C=C, C-C, C=O and C-O groups (by taking suitable examples). Graphical representation of IR spectra of benzoic acid and methyl benzoate		
14	53	NMR Spectroscopy: Basic principles of proton magnetic resonance , nuclear magnetic spin quantum number I, influence of the magnetic field on the spin of nuclei, spin population, saturation using radio frequency	14	Repetition of experiments
	54	Manufacture of Steel (removal of silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.		
	55	Role of Ca ²⁺ ions in blood clotting, Enzymatic role of iron in haemoglobin and myoglobin, Mg in chlorophyll and cobalt in vitamin-B12		
	56	NMR Spectroscopy: Basic principles of proton magnetic resonance , nuclear magnetic spin quantum number I, influence of the		

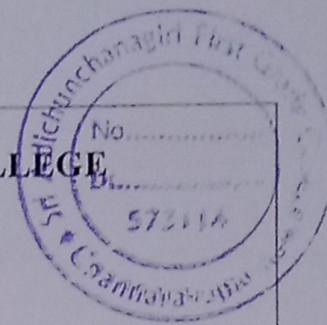
			magnetic field on the spin of nuclei, spin population, saturation using radio frequency, nuclear magnetic resonance-chemical shift (δ value), uses of TMS reference		
B	15	57	nuclear shielding effects, equivalent and non-equivalent protons, spin-spin splitting and coupling. Applications of NMR spectroscopy to simple organic molecules (like ethyl alcohol, ethane, propane, ethylene, methylamine, aniline, benzene, toluene, acetone, acetophenone, methyl cyanide and other simple molecules.	15	Practice lab
		58	Kinetics of fast reactions and techniques: Introduction, examples of fast reactions. Techniques – principle and procedure involved in - stopped flow method, flash photolysis, temperature jump method and pressure jump method.		
		59	. stabilization of protein structures and structural role (bones). Biological functions and toxicity of Cr, Mn, Co, Ni and I, Hg, Mo and Se.		
		60	Revision of syllabus.		



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 B.Sc. Sixth Semester (CBCS)



LESSON PLAN FOR THE SESSION 2022-23(Even Semester)

Name of the Faculty : Dr.B.N.Chandrashekar, (Theory)

Semester : VI

Title of the Paper : SEC:4CHEMICAL TECHNOLOGY, PESTICIDE
 CHEMISTRY & SOCIETY

Subject code : SEC:4

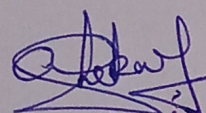
Lesson Plan Duration : 15 weeks

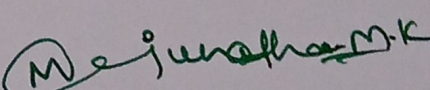
Total teaching period : 30 Hrs.

Work Load (Lecture/Practical) Per Week (in hours): Lecture - 02, Practical – 00

Part	Week	Theory	
		Lecture Day	Topic including Assignment/Test
A	1	1	Chemical Technology: Basic principles of distillation
		2	Solvent extraction, solid-liquid leaching
	2	3	Liquid-liquid extraction
		4	An introduction into the scope of different types of equipment needed in chemical technology, Including reactors
	3	5	
		6	Distillation columns
	4	7	Extruders
		8	Pumps, mills
	5	9	Emulgators. Scaling up operations in chemical industry.
		10	Introduction to clean technology.
6	11	Pesticide Chemistry General introduction to pesticides (natural and synthetic),	
	12	benefits and adverse effects	

7	13	Changing concepts of pesticides,	
	14	structure activity relationship, synthesis and technical manufacture	
8	15	Uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene,)	
	16	Organophosphates (Malathion, Parathion)	
9	17	Carbamates (Carbofuran and carbaryl);	
	18	Quinones (Chloranil),	
10	19	Anilides (Alachlor and Butachlor).	
	20	Unit Test for Chapter 1 and 2	
11	21	Society: Exploration of societal and technological issues from a chemical perspective.	
	22	Chemical and scientific literacy as a means to better understand topics like air and water	
12	23	The trace materials found in water and air that are referred to as pollutants)	
	24	Energy from natural sources (i.e. solar and renewable forms)	
13	25	Fossil fuels and from nuclear fission	
	26	Materials like plastics and Polymers and their natural analogues	
14	27	Proteins and nucleic acids, and molecular reactivity	
	28	Interconversions from simple examples like combustion to complex instances like genetic engineering and the manufacture of drugs.	
B	15	29	Revision of syllabus.
		30	Revision of syllabus.


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