SRI Y.N.COLLEGE (Autonomous), NARSAPUR-534275											
		ANNUAL CURRICI	JLAR PLA	N-YEAR 2021	-2022						
Nar	ne of the	E Lecturer: Ch.Udaya Bhaskararao, Ch. Sujitha & G.N.V.V.S Pavan	kumar	_		Paper	' – I	Clas	ss: I B.Sc		
S			Additional	C	urricula	r activity	70	0	Co-curricular activity		
S. No	Month	Syllabus-Topic	Value Addition	Activity	Hours allotted	Whether Conducted	If not alternate days	Activity	Hours allotted	Whether Conducted	If not alternate days
		Inorganic Chemistry		Orientation		Yes					
		Chemistry of p-block elements :		class							
	NOV	Group -13: Preparation and structure of Diborane and Borazine.									
	2021	Group -14: Preparation, classification and uses of silicones.	Hydraze ne and	Bridge course		Yes		Quiz		Yes	
		Group-15: Preparation and structures of Phosphonitrilic halides	Hydroxy								
		{ $(PNCl_2)_n$ where n=3,4}	lamine								
	DEC	Group -16: Oxides and Oxoacids of sulphur (structures only)									
	2021	Group -17: Structures of Inter halogen compounds and pseudo									
		halogens.									
		Chemistry of d-block elements: Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states. Chemistry of f-block elements: Chemistry of lanthanides -		Assignment		Yes					
		electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides.						Student seminars		Yes	

	Theories of bonding in metals: Valence bond theory, Free electron	Assignment	Yes			
JAN 2022	theory, Explanation of thermal and electrical conductivity of metals					
	based on these theories, Band theory- formation of bands.					
	Physical Chemistry					
	Solid state: Symmetry in crystals. Law of constancy of interfacial					
	angles. The law of rationality of indices. The law of symmetry. Miller			Student	Yes	
	indices, Definition of lattice point, space lattice, unit cell. Derivation of			seminars		
	Bragg's equation. Defects in crystals. Stoichiometric and non-					
	stoichiometric defects.					
FED	Gaseous state: Vander Waal's equation of state. Critical phenomena.	Assignment	Yes			
FEB 2022	Relationship between critical constants and vander Waal's constants.					
	Law of corresponding states. Joule Thomson effect.					
	Liquid state: Liquid crystals, the mesomorphic state. Classification of			National		
	liquid crystals into Smectic and Nematic. Differences between liquid			Science	Yes	
	crystal and solid/liquid. Application of liquid crystals as LCD devices.			Day		
	Solutions: Liquid-liquid - ideal solutions, Raoult's law. Ideally dilute	Assignment	Yes			
	solutions, Henry's law. Azeotropes-HCl-H ₂ O, ethanol-water systems.					
	Partially miscible liquids- phenol-water system. Effect of impurity on					
	consulate temperature. Nernst distribution law. Applications of					
	distribution law.					
	Ionic equilibrium: Ionic product, common ion effect, solubility and					
	solubility product. Calculations based on solubility product.					
I		2				

MAR	Dilute solutions: Colligative properties- Relative lowering of vapour	Assignment	Yes	Student	Yes	
2022	pressure, Osmotic pressure, Elevation of boiling point and depression of	Mid-Exams	Yes	seminars		
	freezing point. Experimental methods for determination of depression in	Sem End	Yes			
	freezing point and osmotic pressure, Abnormal Colligative properties.	Exams				

		SRI Y.N.COLLEGE (A	utonomous), NARSAPUR	R-534275	j					
Nor	ma of the	ANNUAL CURRICI	JLAR PLA	N-YEAR 2021	1-2022	Donor	п	Cla	an ID Ca		
Inai	ne of the	ELecturer: Cn.Odaya Bhaskararao, Cn. Sujitha & G.N.V.V.S Pavan	KUMAr Additional	C	urricular	raper	- 11		<u>ss: 1 B.S</u>	: Ilar activity	
S. No	Month	Syllabus-Topic	inputs Value Addition	Activity	Hours allotted	Whether Conducted	If not alternate days	Activity	Hours allotted	Whether Conducted	If not alternate days
		Organic Chemistry.									
	APR	Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes)									
	2022	General methods of preparation of alkanes- Wurtz and Wurtz Fittig									
		reaction, Corey House synthesis, physical and chemical properties of									
		alkanes, Free radical substitutions(Halogenation). Conformational									
		analysis of alkanes (Conformations, relative stability and energy									
		diagrams of Ethane). General methods of preparation of cycloalkanes		Assignment		Yes					
		and relative stability, Baeyer strain theory.									
		Carbon–Carbon pi Bonds (Alkenes and Alkynes)									
	MAY 2022	General methods of preparation, physical and chemical properties.									
		Mechanism of E1,E2 reactions, Saytzeff and Hoffmann eliminations,									
		Electrophilic additions, mechanism (Markownikoff /Anti markownikoff									
		addition) with suitableexamples, Syn and anti-addition-addition of H2,									
		X2, HX. Oxy mercuration – demercuration, hydroboration-oxidation,									
		ozonolysis, hydroxylation, Diels alder reaction-1,2 and 1,4 addition		Assignment		Yes					
		reactions in conjugated dienes.									
		Reactions of alkynes; acidity, electrophilic and nucleophilic additions,									

	hydration to form carbonyl compounds.					
	Benzene and its reactivity					
	Concept of aromaticity, Huckel's rule - application to Benzenoid)			Student	Yes	
	(Benzene, Naphthalene and Non - Benzenoid compounds			seminars		
	(cyclopropenylcation, cyclopentadienyl anion and tropyliumcation)					
	Reactions - General mechanism of electrophilic aromatic substitution,					
	mechanism of nitration, Friedel- Craft's alkylation and acylation.					
	Orientation of aromatic substitution - ortho, para and meta directing	Assistant	Vac			
	groups. Ring activating and deactivating groups with examples	Assignment	res			
	(Electronic interpretation of various groups like NO ₂ and Phenolic).					
	Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy,					
	nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens					
	(Explanation by taking minimum of one example from each type)					
	(General Chemistry)					
JUN	Surface chemistry					
2022	Colloids - Coagulation of colloids- Hardy-Schulze rule. Stability of					
	colloids, Protection of Colloids, Gold number.			Student	Yes	
	Adsorption - Physical and chemical adsorption, Langmuir adsorption	Assignment	Vac	seminars		
	isotherm, applications of adsorption	Assignment	108			
	Chemical Bonding					
	Valence bond theory, hybridization, VB theory as applied toClF3,					

	Ni(CO)4, Molecular orbital theory -LCAO method, construction of					
	M.O. Diagrams for homo-nuclear and hetero-nuclear diatomic					
	molecules (N2, O2, CO and NO).					
	HSAB					
JUL	Pearson's concept, HSAB principle & its importance, bonding in Hard-					
2022	Hard and Soft-Soft combinations (applications).					
	Stereochemistry of carbon compounds	Assignment	Yes			
	Optical isomerism: Optical activity- wave nature of light, plane			Student	Yes	
	polarised light, optical rotation and specific rotation.			seminars		
	Chiral molecules- definition and criteria(Symmetry elements)-					
	Definition of enantiomers and diastereomers - Explanation of optical					
	isomerism with examples- Glyceraldehyde, Lactic acid, Alanine,	Mid Exams	Yes			
	Tartaric acid, 2,3-dibromopentane.					
	D,L, R,S and E,Z- configuration with examples.	Sem end				
	Definition of Racemic mixture – Resolution of racemic mixtures (any 3	exams	Yes			
	techniques).					
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		ANNUAL CURRICU	JLAR PLA	N-YEAR 2021	1-2022						
Nan	ne of the	Lecturer: Ch. Srinivasa Rao, P.Sahithi & G. Vara Prasad		Pa	per-III	Class: II B	.Sc				
S.			Additional inputs	(activity	If not	(Co-curricu	lar activity	If not
No	Month	Syllabus-Topic	Value Addition	Activity	Hours allotted	Whether Conducted	alternate days	Activity	Hours allotted	Whether Conducted	alternate days
		(Organic Chemistry)									
	DEC	Chemistry of Halogenated Hydrocarbons: Alkyl Halides: Methods of									
	2021	preparation and properties, nucleophilic substitution reactions– SN_1 and									
		SN_2 mechanisms with stereo chemical aspects. Aryl Halides:									
		Preparation and properties, nucleophilic aromatic substitution; Relative									
		reactivity of alkyl, allyl, benzyl, vinyl and aryl halides towards									
		nucleophilic substitution reactions.									
		Alcohols & Phenols									
		Alcohols: preparation and properties, Bouvet Blanc Reduction;		Assignment		Conducted					
		Oxidation Of Diols by Per iodic acid and lead Tetraacetate, Pinacol-									
		Pinacolone Rearrangement;						Student		Conducted	
		Phenols: Preparation And Properties; Acidity of phenols, Reimer-						Seminars			
		Tiemann and Kolbe's-Schmidt Reactions, Fries and Claisen									
		Rearrangement with mechanism;									
	JAN	Carbonyl Compounds: Structure, reactivity, preparation and									
	2022	properties; Nucleophilic Addition, Nucleophilic Addition-elimination									
		reactions with ammonia derivatives Mechanisms of Aldol and Benzoin		Assignment		Conducted					
			1								

Condensation, Claisan-Schmidt, Perkin, Cannizzaro and Wittig reaction,					
Beckmann Haloform Reaction And Baeyer Villiger oxidation,					
oxidations and reductions (Clemmensen, wolf -kishner, with LiAlH4					
&NaBH4).					
Active Methylene Compounds:					
Ethyl acetoacetate: keto-enol tautomerism, preparation by Claisen					
condensation,					
Synthetic applications: Preparation of a) monocarboxylic acids. b)			Student	Conducted	
Dicarboxylic acids. c) Reaction with urea			seminars	Conducted	
Diethyl malonate: preparation from acetic acid.					
Synthetic applications: Preparation of a) monocarboxylic acids					
(propionic acid and n-butyric acid). b) Dicarboxylic acids (succinic					
acid and adipic acid) c) α , β -unsaturated carboxylic acids (crotonic acid).					
d) Reaction with urea.	Assignment	Conducted			
Carboxylic Acids and their Derivatives : General methods of					
preparation, physical properties and reactions of monocarboxylic acids,					
effect of substituent acidic strength. Preparation And Reactions Of Acid					
Chlorides, anhydrides, esters and amides; Claisen Condensation,					
Reformatsky reactions and Curtius Rearrangement Reactions involving					
H, OH and COOH groups- salt formation, anhydride formation, acid					
chloride formation, amide formation and esterification (mechanism).					

	Degradation of carboxylic acids by Huns-Diecker reaction,					
FEB 2022	decarboxylation by Schimdt reaction, Arndt- Eistert synthesis,					
	halogenation by Hell- Volhard- Zelinsky reaction.					
	(Spectroscopy)					
	Spectrophotometry: General features of absorption - Beer-Lambert's			National	Ves	
	law and its limitations, transmittance, Absorbance, and molar			Science Day	105	
	absorptivity. Single and double beam spectrophotometers. Application			2.49		
	of Beer-Lambert law for quantitative analysis of 1. Chromium in					
	K ₂ Cr ₂ O ₇ 2. Manganese in Manganous sulphate	Assignment	Conducted			
	Vibrational Spectroscopy: Classical Equation of Vibration,					
	computation of force constant, Harmonic and anharmonic oscillator,					
	Morse Potential curve, vibrational degrees of freedom for polyatomic					
	molecules, Modes of vibrations in diatomic and polyatomic molecules.					
	Selection rules for vibrational transitions, Fundamental Frequencies,					
	overtones and hot bands. functional group and fingerprint region.					
	Electronic spectroscopy: Interaction of electromagnetic radiation with				Conducted	
	molecules and types of molecular spectra. Energy levels of molecular					
MAR	orbitals (σ , π , n). Selection rules for electronic spectra. Types of			Student seminars		
2022	electronic transitions in molecules, effect of conjugation. Concept of					
	chromophore and auxochrome. bathochromic and hypsochromic shifts.	Assignment	Conducted			
	Nuclear Magnetic Resonance (NMR) spectroscopy: Principles of	0				

Application of Spectroscopy to Simple Organic Molecules	
ethyl acetate, toluene and acetophenone.	
examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane,	
coupling, coupling constants. Applications of NMR with suitable	
position of signals. Chemical shift, NMR splitting of signals - spin-spin	
nuclear magnetic resonance, equivalent and non-equivalent protons,	

Application of visible, ultraviolet and Infrared spectroscopy in organic molecules. Application of electronic spectroscopy and Woodward rules for calculating λ max of conjugated dienes and α , β – unsaturated compounds.

Infrared radiation and types of molecular vibrations, IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on >C=O stretching absorptions).

			Conducted	
		Student seminars		
Mid-Exams	Conducted			
Sem end- Exams	Conducted			

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Nor	no of the	ANNUAL CURRICU	JLAR PLA	N-YEAR 2021	1-2022	Class					
Inal		Lecturer: Ch.Srinivasa Kao, D. Suresii & P. Santin	Additional	raper – Iv	Urricular	class:	II D.5C	(Co-curricu	lar activity	
S. No	Month	Syllabus-Topic	inputs Value Addition	Activity	Hours allotted	Whether Conducted	If not alternate days	Activity	Hours allotted	Whether Conducted	If not alternate days
	APR 2022 MAY 2022	(INORGANIC & ORGANIC CHEMISTRY) Organ metallic Compounds: Definition and classification of organometallic compounds on the basis of bond type, Metal Carbonyls:18-electron rule, General methods of preparation of mono and binuclear carbonyls of 3d series. P-acceptor behaviour of carbon monoxide. Carbohydrates: Classification and their biological importance, Monosaccharides: Constitution and absolute configuration glucose and fructose (open chain and cyclic structure), epimers and anomers, mutarotation, osazone formation from glucose and fructose Interconversions of Aldohexose to Ketohexose [(+) Glucose to (-) Fructose] and Ketohexose to Aldohexose (Fructose to Glucose) Kiliani- Fischer synthesis and Ruff degradation; Amino acids and proteins: Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Essential and Non-essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino	Addition	Assignment	allotted	Yes	alternate days	Activity	allotted	Conducted	alternate days
			1								

	acids with examples. Methods of synthesis: General methods of					
	synthesis of alpha amino acids (specific examples - Glycine, Alanine,					
	valine and leucine) by following methods: a) from halogenated			Student	Yes	
	carboxylic acid b) Gabriel Phthalimide synthesis c) strecker's synthesis.			seminars		
	Physical properties: Zwitter ion structure - salt like character -					
	solubility, melting points, amphoteric character, definition of isoelectric					
	point.					
	Chemical properties: General reactions due to amino and carboxyl					
	groups - lactams from gamma and delta amino acids by heating- peptide					
	bond (amide linkage).					
	Heterocyclic Compounds: Introduction and definition: Simple five					
	membered ring compounds with one hetero atom Ex. Furan. Thiophene	Assignment	Yes			
	and pyrrole - Aromatic character - Preparation from 1, 4, -dicarbonyl					
	compounds, Paul-Knorr synthesis. Properties: Acidic character of					
	pyrrole - electrophilic substitution at 2 or 5 position, Halogenation,					
	Nitration and Sulphonation under mild conditions - Diels Alder reaction					
	in furan. Pyridine - Structure - Basicity - Aromaticity- Comparison with			Student	Yes	
	pyrrole- one method of preparation and properties - Reactivity towards			seminars		
	Nucleophilic substitution reaction.					
JUN	(ORGANIC & PHYSICAL CHEMISTRY) Nitro hydrocarbons					
2022	Nomenclature and classification-nitro hydrocarbons, structure -	 			 	

	Taute	tomerism of nitroalkanes leading to aci and keto form, Preparation	Assignment	Yes					
	of Ni	Vitroalkanes, reactivity -halogenation, reaction with HONO (Nitrous							
	acid)), Nef reaction and Mannich reaction leading to Micheal addition							
	and r	reduction.							
	Ami	ines:							
	Intro	oduction, classification, chirality in amines (pyramidal inversion),							
	impo	ortance and general methods of preparation.							
	Prop	perties : Physical properties, Basicity of amines: Effect of				Student		Yes	
	subst	stituent, solvent and steric effects. Distinction between Primary,				seminars			
	secon	ondary and tertiary amines using Hinsberg's Method And Nitrous							
	Acid	d. Discussion of the following reactions with emphasis on the							
	mech	hanistic pathway: Gabriel Phthalimide synthesis, Hoffmann-							
	Bron	mamide Reaction, Carbylamine Reaction, Mannich reaction,							
	Hoff	fmann's exhaustive methylation, Hofmann-elimination reaction and							
	Cope	e elimination.							
	Phot	tochemistry: Difference between thermal and photochemical							
	proce	eesses, Laws of photochemistry- Grothus- Draper's law and Stark-	Assignment	Yes					
	Einst	stein's law of photochemical equivalence, Quantum yield-	U						
	Photo	tochemical reaction mechanism- hydrogen- chlorine and hydrogen-							
	brom	nine reaction. Qualitative description of fluorescence,							
	phos	sphorescence, Photosensitized reactions.							
1				1	1		1	1	1

JUL	Thermodynamics: The first law of thermodynamics-statement,]
2022	definition of internal energy and enthalpy, Heat capacities and their					
	relationship, Joule-Thomson effect- coefficient, Calculation of work for					
	the expansion of perfect gas under isothermal and adiabatic conditions					
	for reversible processes, State function. Temperature dependence of					
	enthalpy of formation- Kirchoffs equation, Second law of					
	thermodynamics Different Statements of the law, Carnot cycle and its	Mid Exams	Yes			
	efficiency, Carnot theorem, Concept of entropy, entropy as a state					
	function, entropy changes in reversible and irreversible processes.	Sem end				
	Entropy changes in spontaneous and equilibrium processes. Third law	exams	Yes			
	of thermodynamics, Nernst heat theorem, Spontaneous and non-					
	spontaneous processes, Helmholtz and Gibbs energies-Criteria for					
	spontaneity.					

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NT	6.1	ANNUAL CURRICU	JLAR PLA	N-YEAR 2021	-2022	<u>(1)</u>	D G				
Nar	ne of the	Lecturer: Dr. S. B. Ronald & Dr. B. Ananda kumar	Additional	Paper – V	urricular	Class: II	B.Sc	(o curricu	lar activity	
S. No	Month	Syllabus-Topic	inputs Value Addition	Activity	Hours allotted	Whether Conducted	If not alternate days	Activity	Hours allotted	Whether Conducted	If not alternate days
	APR 2022 MAY 2022	(INORGANIC CHEMISTRY) Coordination Chemistry: IUPAC nomenclature of coordination compounds, Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Valence Bond Theory (VBT): Inner and outer orbital complexes. Limitations of VBT, Crystal Filed Theory:- Splitting of d-orbitals in Octahedral, Tetrahedral and Square-planar complexes, Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Factors affecting the magnitude of crystal field splitting energy, Spectrochemical series, Comparison of CFSE for Octahedral and Tetrahedral complexes, Jahn-Teller distortion, Inorganic Reaction Mechanism: Introduction to inorganic reaction mechanisms. Concept of reaction pathways, transition state, intermediate and activated complex. Labile and inert complexes, ligand substitution reactions -SN1 and SN2, Substitution reactions in square planar complexes, Trans-effect, theories of trans effect and its applications Stability of metal complexes: Thermodynamic stability and kinetic	1	Assignment		Yes	uays				uays

	stability, factors affecting the stability of metal complexes, chelate					
	effect, determination of composition of complex by Job's method and					
	mole ratio method.			Student	Yes	
JUN	Bioinorganic Chemistry: Metal ions present in biological systems,			seminars		
2022	classification of elements according to their action in biological system.					
	biological significance of Na, K, Mg, Ca, Fe and Cl ⁻ . Excess and					
	deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and					
	As), reasons for toxicity, Use of chelating agents in medicine, Cis-platin	Assignment	Vac			
	as an anti-cancer drug. Metalloporphyrins - Structure and functions of	Assignment	ies			
	hemoglobin and Chlorophyll.					
	(PHYSICAL CHEMISTRY)					
	Phase rule: Concept of phase, components, degrees of freedom.					
	Thermodynamic derivation of Gibbs phase rule. Phase diagram of one					
	component system - water system, Study of Phase diagrams of Simple					
	eutectic systems i) Pb-Ag system, desilverisation of lead ii) NaCl-Water					
	system, Congruent and incongruent melting point- Definition and					
	examples for systems having congruent and incongruent melting point,			Student	Yes	
	freezing mixtures.	Assignment	Ves	seminars		
	Electrochemistry: Specific conductance, equivalent conductance and	Assignment	105			
JUL 2022	molar conductance- Definition and effect of dilution. Cell constant.					
	Strong and weak electrolytes, Kohlrausch's law and its applications,					

	Definition of transport number, determination of transport number by					
	Hittorf's method. Debye-Huckel-Onsager's equation for strong					
	electrolytes (elementary treatment only), Application of conductivity					
	measurements- conduct metric titrations.Electrochemical Cells- Single					
	electrode. potential, Types of electrodes with examples: Metal- metal					
	ion, Gas electrode, Inert electrode, Redox electrode, Metal-metal					
	insoluble salt- salt anion. Determination of EMF of a cell, Nernst	Assignment	Yes			
	equation, Applications of EMF measurements - Potentiometric	0		Student	Yes	
	titrations. Fuel cells- Basic concepts, examples and applications			seminars	100	
	Chemical Kinetics: The concept of reaction rates. Effect of					
	temperature, pressure, catalyst and other factors on reaction rates. Order					
	and molecularity of a reaction, Derivation of integrated rate equations					
	for zero, first and second order reactions (both for equal and unequal					
	concentrations of reactants). Half-life of a reaction. General methods					
	for determination of order of a reaction. Concept of activation energy	Mid Exams	Yes			
	and its calculation from Arrhenius equation. Theories of Reaction Rates:					
	Collision theory and Activated Complex theory of bimolecular	Sem end	Yes			
	reactions. Comparison of the two theories (qualitative treatment	exams				
	only).Enzyme catalysis- Specificity, factors affecting enzyme catalysis,					

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		ANNUAL CURRICU	JLAR PLA	N-YEAR 2021	-2022						
Nan	ne of the	Lecturer: Ch.R.V.R. Prasad, Ch. Srinivasa Rao & D.Suresh		_			Cla	uss: III B.Sc	P	aper - V	
G			Additional	C	urricula	activity	TO (C	o-curricu	lar activity	T 0
No	Month	Syllabus-Topic	Value Addition	Activity	Hours allotted	Whether Conducted	lf not alternate days	Activity	Hours allotted	Whether Conducted	lf not alternate days
		INORGANIC CHEMISTRY									
	SEP	Reactivity of metal complexes: Labile and inert complexes,									
	2021	ligand substitution reactions - SN^1 and SN^2 , substitution reactions of									
		square planar complexes - Trans effect and applications of trans effect.									
		Bioinorganic chemistry: Essential elements, biological significance									
		of Na, K, Mg, Ca, Fe and Cl ⁻ . Metalloporphyrins – Structure and		Assignment		Yes					
		functions of hemoglobin and Chlorophyll.									
		PHYSICAL CHEMISTRY									
	OCT	Chemical kinetics: Rate of reaction - Definition of order and		BOS		Ves					
	2021	molecularity. Derivation of rate constants for first, second, third and				103					
		zero order reactions and examples. Derivation for time half change.									
		Methods to determine the order of reactions. Effect of temperature on									
		rate of reaction, Arrhenius equation, concept of activation energy.									
		Photochemistry: Difference between thermal and photochemical		Assignment					X 7		
		processes. Laws of photochemistry- Grothus-Draper's law and Stark-		C C		Yes	Student		Yes		
		Einstein's law of photochemical equivalence. Quantum yield-					seminar				
		Photochemical reaction mechanism- hydrogen- chlorine, hydrogen-									

	bromine reaction. Qualitative description of fluorescence,					
	phosphorescence, Photosensitized reactions- energy transfer processes					
	(simple example)					
	ORGANIC CHEMISTRY					
	Heterocyclic Compounds: Introduction and definition: Simple five	Assignment	Yes	Student	Yes	
NOV 2021	membered ring compounds with one hetero atom Ex. Furan. Thiophene			semmar		
	and pyrrole - Aromatic character - Preparation from 1,4,- dicarbonyl					
	compounds, Paul-Knorr synthesis.					
	Properties : Acidic character of pyrrole - electrophillic substitution at 2			QUIZ		
	or 5 position, Halogenation, Nitration and Sulphonation under mild				Yes	
	conditions - Diels Alder reaction in furan.					
	Pyridine - Structure - Basicity - Aromaticity - one method of					
	preparation and properties - Reactivity towards Nucleophilic					
	substitution reaction.					
550	Carbohydrates: Monosaccharides: (+) Glucose (aldo hexose) -					
DEC 2021	Evidence for cyclic structure of glucose (some negative aldehydes tests					
	and mutarotation) - Pyranose structure (Haworth formula).	Assignment	Yes			
	(-) Fructose (ketohexose) - Evidence of 2 - ketohexose structure	C				
	(formation of pentaacetate, formation of cyanohydrin its hydrolysis and					
	reduction by HI). Cyclic structure for fructose (Furanose structure and					
	Haworth formula) - osazone formation from glucose and fructose -					

	Definition of anomers with examples.					
	Interconversion of Monosaccharides:			Student	Yes	
	Aldopentose to Aldohexose (Arabinose to D- Glucose, D-Mannose)			seminar		
	(Kiliani - Fischer method). Epimers, Epimerisation - Lobry de bruyn					
	van Ekenstein rearrangement. Aldohexose to Aldopentose (D-Glucose					
	to D- Arabinose) by Ruff degradation.					
	Aldohexose to Ketohexose [(+) Glucose to (-) Fructose] and Ketohexose	Assignment	Yes			
	to Aldohexose (Fructose to Glucose).	C				
JAN 2022	Amino acids and proteins: Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, valine and leucine) by following methods: a) from halogenated carboxylic acid b) Malonic ester synthesis c) strecker's synthesis. Physical properties: Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.	Mid-Exams Sem End Exams	Yes Yes			
	Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating peptide					
	bond (amide linkage). Definition and examples of peptides and proteins.					

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	6.1	ANNUAL CURRICI	JLAR PLA	N-YEAR 202	1-2022				<u> </u>		
Nai	ne of the	e Lecturer: P. Sahithi, D. Suresh & P. Naresh	A 1 1 4 1 1	Paper	-VI				Class: I	III B.Sc	
S. No	Month	Syllabus-Topic	Additional inputs Value Addition	Activity	Hours allotted	Whether Conducted	If not alternate davs	Activity	Hours allotted	Whether Conducted	If not alternate davs
	SEP 2021 OCT 2021	INORGANIC CHEMISTRY <u>Coordination Chemistry:</u> Important terms and their definitions: - Double salts, Complex ion, Central metal, Ligand, Coordination sphere, Coordination number. IUPAC nomenclature. Bonding Theories: - Werner's theory and Sidgwick's concept of coordination, EAN rule. Valencey Bond Theory- geometries, formation and magnetic properties of the complexes with coordination numbers 4-tetrahedral and square planar complexes and 6- octahedral complexes, limitations of Valency Bond Theory. Crystal Filed Theory:- Splitting of d-orbitals in Octahedral, Tetrahedral and Square-planar complexes, low spin and high spin complexes. Spectral and magnetic properties of metal complexes: Electronic absorption spectrum of $[Ti(H_2O)_6]^{3+}$ ion. Types of magnetic behavior, spin-only formula, calculation of magnetic moments, Experimental determination of magnetic susceptibility- Gouy method. Stability of metal complexes: Factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and Mole ratio method.		Assignment BOS Assignment		Yes Yes		Student seminars		Yes	

	ORGANIC CHEMISTRY		Yes			
	Nitro alkanes: Nomenclature and classification of nitroalkanes,					
NO	structure -Tautomerism of nitroalkanes leading to aci and keto form,					
202	Preparation of Nitroalkanes, reactivity -halogenation, reaction with			QUIZ	Yes	
	HNO ₂ (Nitrous acid), Nef reaction, Mannich reaction and Micheal					
	addition reaction.					
	Amines: Classification into 1°, 2°, 3° Amines and Quarternary					
	ammonium compounds. Preparative methods –	A	V	Student seminars	Yes	
	1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's	Assignment	res	semmars	105	
	bromamide reaction (mechanism). Reduction of Amides and Schmidt					
	reaction. Physical properties and basic character - Comparative basic					
	strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine					
	and aniline – comparative basic strength of aniline, N-methylaniline and					
	N,N-dimethyl aniline (in aqueous and non-aqueous medium), steric					
	effects and substituent effects. Chemical properties: a) Alkylation b)					
DEC 202	Acylation c) Carbylamine reaction d) Hinsberg separation e) Reaction					
	with Nitrous acid of 1° , 2° , 3° (Aliphatic and aromatic amines).					
	Electrophillic substitution of Aromatic amines - Bromination and					
	Nitration., Diazotization.					
	Cyanides and Isocyanides: Preparation of Cyanides from: a) Alkyl					
	halides b) from Amides c) from Aldoximes. Preparation of Isocyanides	Assignment	Yes	Student		
				seminars	Yes	

	from: Alkyl halides and Amines. Chemical properties of Cyanides and				
	Isocyanides:				
	a) hydrolysis b) addition of Grignard reagent c) reduction d) oxidation.				
	PHYSICAL CHEMISTRY				
	Thermodynamics: The first law of thermodynamics-statement,				
IAN	definition of internal energy and enthalpy. Heat capacities and their				
2022	relationship. Joule-Thomson effect- coefficient. Calculation of w, for	Assignment	Yes		
	the expansion of perfect gas under isothermal and adiabatic conditions				
	for reversible processes. State function. Temperature dependence of				
	enthalpy of formation-Kirchoff s equation. Second law of				
	thermodynamics. Different Statements of the law. Carnot cycle and its	Mid-Exams	Yes		
	efficiency. Carnot theorem. Concept of entropy, entropy as a state	Sem End	Yes		
	function, entropy changes in reversible and irreversible processes.	Exams			
	Entropy changes in spontaneous and equilibrium processes.				

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	ANNUAL CURRICULAR PLAN-YEAR 2021-2022											
Nar	ne of the	Lecturer: Dr. S.B. Ronald & Dr. B. Ananda Kumar						Class: III B.Sc Paper-VII				
			Additional	C	Curricula	r activity		0	Co-curricu	ılar activity		
S. No	Month	Syllabus-Topic	inputs Value Addition	Activity	Hours allotted	Whether Conducted	If not alternate days	Activity	Hours allotted	Whether Conducted	If not alternate days	
	FEB 2022 MAR 2022	 ENVIRONMENTAL CHEMISTRY UNIT-1 Introduction: Concept, scope and importance of Environmental Chemistry - Definitions of some terms used in Environmental Chemistry: Pollutant, Contaminant, Receptor, Sink, TLV- Segments of environment, Renewable resources: Solar and Biomass energy-Non- renewable resources: Thermal power and atomic energy - Reactions of atmospheric oxygen and Hydological cycle. <u>UNIT-II</u> AirPollution: Definition – Sources of air pollution – Classification of air pollutants – Acid rain – Photochemical smog – Green house effect – Formation and depletion of ozone – Bhopal gas disaster – Controlling methods of air pollution. <u>UNIT-III</u> Chemical Toxicology: Toxic chemicals in the environment – effects of toxic chemicals – cyanide and its toxic effects – pesticides and its biochemical effects – toxicity of lead, mercury, arsenic and cadmium. <u>UNIT-IV</u> Water pollution: Unique physical and chemical properties of water - Classification of water pollutants - Dissolved oxygen, BOD, COD- Hardness of water - Methods to convert temporary hard water into soft water- 		Assignment Assignment Assignment Assignment		Yes Yes Yes		National Science day Student seminars		Yes Yes Yes	uays	
	MAY 2022	Eutrophication and its effects- Methods of purifying waste water(Waste water treatment) <u>UNIT-V</u> Ecosystem and biodiversity: Ecosystem: Concepts – structure –										

Functions and types of ecosystem – Abiotic and biotic components –	Assignment	Yes		
Energy flow and Energy dynamics of ecosystem – Food chains – Food				
web - Tropic levels - Biogeochemical cycles (carbon, nitrogen and				
phosphorus)				
Biodiversity: Definition – level and types of biodiversity – concept -	Mid-Exams	Yes		
significance – magnitude and distribution of biodiversity - biogeographical classification of India - biodiversity at national, global and regional level.	Sem End Exams	Yes		

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	6.1	ANNUAL CURRICU	JLAR PLA	N-YEAR 2021	-2022						
Nai	ne of the	e Lecturer: Ch.R.V.R. Prasad		- Paper	- <u>CE - 1</u>			Class: III B.Sc			
s			Additional inputs		urricula	r activity	Ifnot	C	Co-curricu	lar activity	Ifnot
No	Month	Syllabus-Topic	Value Addition	Activity	Hours allotted	Whether Conducted	alternate days	Activity	Hours allotted	Whether Conducted	alternate days
		FUEL CHEMISTRY AND BATTERIES									
		UNIT –I	Assignment								
	FED	Review of energy sources (renewable and non-renewable) -				N				37	
	FEB 2022	classification of fuels and their calorific value. Coal: Uses of Coal (fuel			Yes		Science		Yes		
		and non fuel) in various industries, its composition, carbonization of						day			
		coal. Coal gas, producer gas and water gas -Manufacture, composition									
		and uses. Requisites of a good metallurgical coke, coal gasification									
		(Hydro gasification and catalytic gasification).									
		UNIT-II									
		Lubricants: Classification of lubricants, lubricating oils (conducting		Assignment						Yes	
	MAR	and non-conducting), solid and semi solid lubricants, synthetic		Assignment		Yes					
	2022	lubricants. Properties of lubricants (viscosity index, cloud point, pore						Student			
		point) and their determination. Applications of lubricants.						seminars			
		UNIT-III									
		Crude petroleum and petrochemicals: Composition of crude		Assignment		Vac					
	APR	petroleum, refining of petroleum and different types of petroleum		Assignment		Yes					
	2022	products and their applications. Petro chemicals: vinyl acetate,									

		propylene oxide, isoprene, butadiene, toluene and its derivative xylene.					
		UNIT-IV				Yes	
	MAY	Fractional distillation (principle and process), cracking (Thermal and	A asi an mant				
		catalytic cracking). Reforming (Thermal and catalytic) Petroleum and	Assignment	Yes	Student		
		non petroleum fuels. LPG, CNG, LNG, bio-gas, synthetic fuels (gaseous			seminars		
		and liquids).					
		UNIT-V					
		Batteries: Primary and secondary batteries, battery components and		Ves			
		their role, Characteristics of Battery. Working of following batteries: Pb	Assignment				
		acid, Li-Battery. Fuel cells and Solar cell.					

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		ANNUAL CURRICU	JLAR PLA	N-YEAR 2021	-2022						
Nan	ne of the	e Lecturer: Ch. Udayabhaskara Rao		Paper – CE - 2				Class: III B.Sc			
s.			Additional inputs	C	urriculai	activity	If not	C			If not
No	Month	Syllabus-Topic	Value Addition	Activity	Hours allotted	Whether Conducted	alternate days	Activity	Hours allotted	Whether Conducted	alternate days
		INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE									
											l
	FEB	Recapitulation of s- and p-Block Elements: Periodicity in s- and p-									I
	2022	block elements with respect to electronic configuration, atomic and						National		N	
		ionic size, ionization enthalpy, electronegativity (Pauling, Mulliken					day	day	ice	Yes	
		and Alfred – Rochow scales). Allotropy in C, S, and P. Oxidation states		Assignment		Yes		2			
		with reference to elements in unusual and rare oxidation states like									
		carbides and nitrides), inert pair effect, diagonal relationship and									
		anomalous behaviour of first member of each group.									
		<u>UNIT – II</u>									
	MAR	Silicate Industries:						Student		Yes	
	2022	Glass: Glassy state and its properties, classification(silicate and non-						seminars			
		silicate glasses). Manufacture and processing of glass. Composition and									
		properties of the following types of glasses: Soda lime glass, lead glass,		Assignment		Yes					
	armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured										
	glass, photosensitive glass.										
		Ceramics: Important clays and feldspar, ceramic, their types and									
											1

	The second secon					,
	manufacture. High technology ceramics and their applications,					
	superconducting and semiconducting oxides, fullerenes, carbon					
	nanotubes and carbon fibre.					
	Cements: Classification of cement, ingredients and their role,					
	Manufacture of cement and the					
	setting process, quick setting cements.					
	<u>UNIT – III</u>					
	Fertilizers: Different types of fertilizers. Manufacture of the following	Accionment	Yes	Student	Yes	
APR	fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate,	Assignment		seminars		
2022	ammonium phosphate, polyphosphate, superphosphate, compound and					
	mixed fertilizers, potassium chloride, potassium sulphate.					
	<u>UNIT – IV</u>					
	Surface Coatings: Objectives of coatings surfaces, classification of					
	surface coatings. Paints and pigments-formulation, composition and					
	related properties. Oil paint, Vehicle, modified oils, Pigments, toners					
	and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents.	Assignment	Yes			
	Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic		105			
	paint), Dyes, methods of dying, classification of dyes, Wax polishing,					
	Water and Oil paints, additives, Metallic coatings (electrolytic and					
	electrolysis).					

	<u>UNIT – V</u>					
	Alloys: Classification of alloys, ferrous and non-ferrous alloys, Specific	Assignment	Yes			
MAY	properties of elements in alloys. Manufacture of Steel (removal of					
2022	silicon decarbonization, demanganization, desulphurization					
	dephosphorisation) and surface treatment (argon treatment, heat					
	treatment, nitriding, carburizing). Composition and properties of					
	different types of steels.					
	Chemical explosives: Origin of explosive properties in organic	Mid Exama				
	compounds, preparation and explosive properties of	WIIG-EXAIIIS	Yes			
	lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.	Sem End Exams	Yes			

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		ANNUAL CURRICU	JLAR PLA	N-YEAR 202	1-2022						
Nar	ne of the	e Lecturer: Ch.R.V.R. Prasad		Paper	<u>– CE - 3</u>			Class: III B.Sc			
c			Additional	Curricula		r activity		Co-curricular activity			T0
S. No	Month	Syllabus-Topic	Value Addition	Activity	Hours allotted	Whether Conducted	If not alternate days	Activity	Hours allotted	Whether Conducted	If not alternate days
		ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS									
	FEB	UNIT-I									
	2022	Analysis of soaps: moisture and volatile matter, combined alkali, total				T 7					
		fatty matter, free alkali, total fatty acid.		Assignment		Yes		National Science		Yes	
		Analysis of oils: saponification value, iodine value, acid value, ester						day			
		value.									
		UNIT- II									
		Analysis of paints : Vehicle and pigments, Barium Sulphate, total lead,		Assignment		Yes					
	MAR	lead chromate, iron pigments, zinc chromate. Analysis of starch, sugars,									
	2022	cellulose and paper.				St	Student		Yes		
		UNIT-III						seminars			
		Analysis of fertilizers: urea, super phosphate.		Assignment		Yes					
		Analysis of Pesticides: DDT, BHC.									
	APR	UNIT -IV									
APR 2022	Analysis of industrial solvents like benzene, acetone, methanol and										
		acetic acid,				Yes					
		Gas analysis: carbon dioxide, carbon monoxide, oxygen, hydrogen,		Assignment							

	saturated hydro carbons, unsaturated hydrocarbons, nitrogen, octane					
	number, cetane number.			Student	Yes	
	Proximate and Ultimate analysis of coal: carbon, hydrogen, nitrogen,			seminars	105	
	oxygen, phosphorus and sulfur.					
	UNIT - V					
MAY 2022	Analysis of cement- loss on ignition, insoluble residue, total silica,	Assignment	Yes			
	sesqui oxides, lime, ferric oxide, sulphuric anhydride.					
	Analysis of glasses - Determinaiton of silica, sulphur, calcium,					
	magnesium, chloride.					