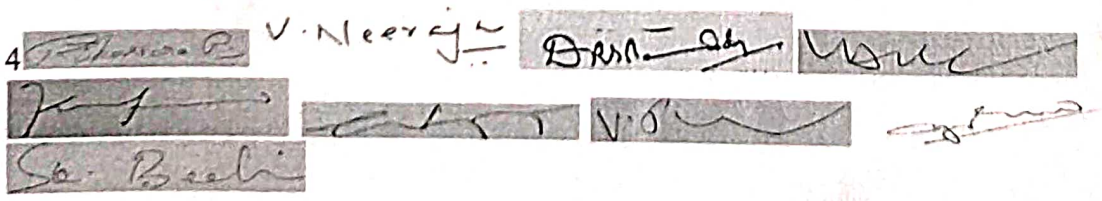
SRR & CVR GOVT.DEGREE COLLEGE(A)

Department of Chemistry

Composition of Board of studies committee

S.No	Category	Designation	Name of the Chairperson & Members of Board of studies	Remarks
1	Educational	Chairperson	Dr.V.Neeraja	
2	University Nominee	Member	Dr.D.Rama Sekhar Reddy	Nominated by university
3	Subject expert	Member	Dr.Y.Hanumantha Rao	
4	Subject expert	Member	Dr.R. Bhaskara Rao	
5	Faculty	Member	Sri K.V.S.Prasad	
6	Faculty	Member	Dr.G.Nagarjuna	
7	Faculty	Member	Dr.V.PhaniKumar	
8	Faculty	Member	SriG.V.Swaroop Singh	
9	Faculty	Member	Dr.SK.Beebi	



Department of chemistry

Board of studies resolutions for
Conventional courses of

1.Mathematics, Physics & Chemistry (E.M)

2.Mathematics, Physics & Chemistry (T.M)

3.Botany , Zoology, Chemistry (E.M)

4.Botany , Zoology, Chemistry (T.M)

Restructured courses of

1.Microbiology ,Biochemistry , Chemistry (M.B.C)

2.Aquaculture Technology, Zoology ,Chemistry (At.Z.C)

3.Mathematics ,Chemistry , Computer science(M.C.Cs)

5

S.R.R. & C.V.R. Govt. DEGREE COLLEGE (Autonomous) VIJAYAWADA

DEPARTMENT OF CHEMISTRY

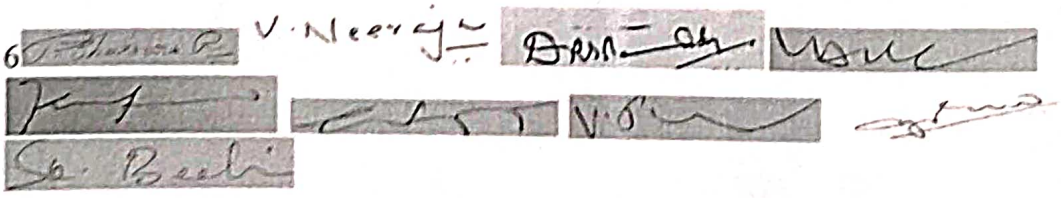
Minutes of Board Of Studies in chemistry I ,II,III &Vsemester

The meeting of the upgradation of syllabus for U.G (BOS) in the subject of chemistry was held on 26-11-2020 at 3PM through google meet at SRR & CVR Govt.Degree College (Autonomous) Vijayawada.The following members attended the meeting through online:

1. Dr. V. Neeraja - In-Charge of the Department & Chairperson BOS
2. Dr. D.Rama sekhar reddy -University nominee
3. Dr. Y.Hanumantha Rao - Subject Expert
4. Dr. Bhaskara Rao - Subject Expert
5. Sri K.V.S. Prasad - Faculty member
6. Dr. G.Nagarjuna - Faculty member
7. Dr. V.Phani Kumar - Faculty member
8. Sri. G.V.Swaroop Singh - Faculty member
9. Dr. SK.Beebi - Faculty member

Agenda :

1. Approval of the i. Syllabus, ii. Model Question paper, iii. Blue Print and iv. Question Bank of the Semesters I,II , III &V.
2. Approval of the duration of the Examination for 3 hours.
3. Approval of the Syllabus, Model Question paper, Blue Print and Question Bank of the Semesters I, II for i.Life Skills and ii. Skill Development Course i.e Approval of food adulteration syllabus under skill development courses under CBCS framework with effect from 2020-21.
4. Approval of the activities proposed by the department, stipulated Credits, Work Load, Internal Marks, Scheme of valuation etc...



5. Approval of Online Examination pattern in case COVID 19 doesn't subside at the time of examinations (MCQs Pattern).

The Chairperson welcomed the members and had discussion on the Agenda. She appraised the members of the guidelines of the UGC, APSCHE, Krishna University and the CCE regarding the framing of Syllabus, etc., and the recommended evaluation ratio for internal before them and unanimously resolved the following :

The members of BOS Meeting Resolved:

1. To approve the syllabus for Semesters I, II -- APSCHE's Syllabus for the announced subjects and the existing syllabus for other subjects for the academic year 2020- 2021.

Sem III Details: Paper III ,Inorganic & Organic chemistry

Sem V Details: Paper V&PaperVI ,Inorganic organic chemistry &Physical chemistry

(Due to COVID - 19 consequences, as per the Staff Council Resolutions, II Sem is also included along with the I Semester. Please include the details of BOS of III and V Semesters above, if any).

2 : To approve the i. Syllabus, ii. Model Question paper, iii. Blue Print and iv. Question Bank of the Semesters I,II,III ,V

3 : To approve the validity of this Syllabus for next three Years.

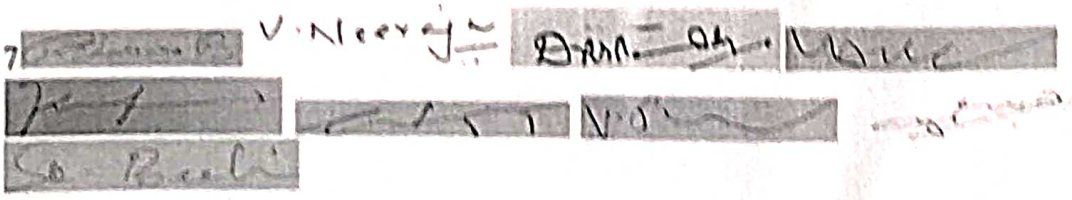
4 : To follow the Autonomous pattern of Total 100 marks as : i. Theory of 60 Marks, and ii. Internal Assessment of 40 marks.

5: To follow the Practicals components' Structure as resolved by the Science groups as Internal assessment - 25 marks and External assessment - 25 Marks

6 : To follow Internal Assessment of 40 Marks Uniform pattern breakup resolved by the Autonomous Body / Committee.

7 : B O S Meeting is Online, Meeting pass code ID :

https://meet.google.com/eme-seii-hpn?hs=122&authuser=2

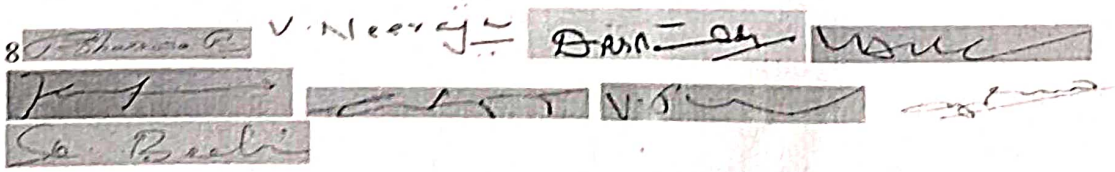


8. To approve the syllabus of bridge course with 15 hours at the initial stage of I B.Sc .

I. Details of Members attended:

S.No	Name /Designation	Status of the expert	Online/offline/Blended
1	Dr.V.Neeraja In-charge of the Department	Chairperson, BOS	Offline
2	Dr.D.Rama Sekhar Reddy	University Nominee	Online
3	Dr. Y.HanumathaRao	Subject Expert	Online
4	Dr.Bhaskara Rao	Subject Expert	Online
5	Sri K.V.S.Prasad	Faculty member	Offline
6	Dr.G.Nagarjuna	Faculty member	Offline
7	Dr.V.Phani Kumar	Faculty member	Online
8	Sri.G.V.Swaroop Singh	Faculty member	Offline
9	Dr. SK.Beebi	Faculty member	Offline

9 .To approve the stipulated Credits, Work Load, Internal Marks breakup etc.,.



10: To approve Online Examination pattern in case COVID 19 doesn't subside at the time of Examinations

(MCQs Pattern).

11. To Approve the i. Syllabus, ii. Model Question paper, iii. BluePrint and iv. Question Bank of the Semesters I, II for i. Life Skills and ii. Skill Development Courses.

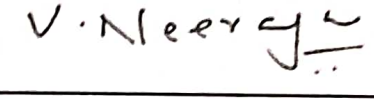
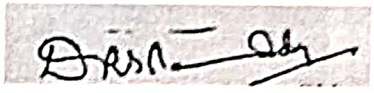
Details of Skill Dev. Courses: . Food Adulteration.

12. Any other Resolutions, with the approval of the Chair: NIL

12. To approve any other valid inclusion in B O S, with the permission of the Principal and Controller

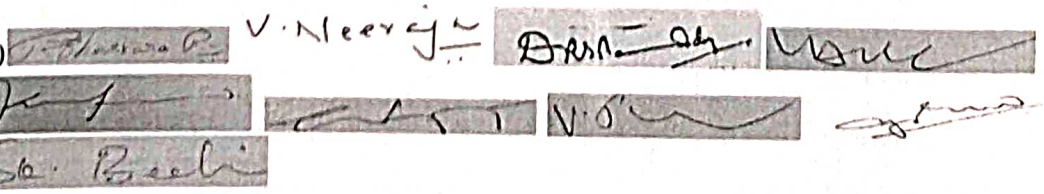
of Examinations (C O E). Details are given below: NIL

Signatures of the members of the BOS Meeting:

S.No	Name & Designation	Status	Signature
1.	Dr.Neeraja In-charge	Chairperson	
2.	Dr.D.Ramasekhar Reddy Asst.professorKRU	University nominee	
3.	Dr.YHanumanthe Rao	Subject Expert	
4.	Dr.Bhaskara Rao	Subject Expert	
5	Sri KVS Prasad	Faculty member	
6.	Dr.G.Nagarjuna	Faculty member	
7.	Dr.V.Phani kumar	Faculty member	
8.	Sri.GVSS.Singh	Faculty member	
9	Dr.SK Beebi	Faculty member	

Counter signed by:

Principal
SRR & CVR Govt Degree College (A) Vijayawada

10 

Department of chemistry

SRR & CVR Govt.Degree college(A) Vijayawada

Programme Objectives:

On successful completion of the **B.Sc Chemistry** Programme, students are able to:

(i) Understand Systematic and fundamental concepts of chemistry as a discipline.

(ii) Acquire Skill and related developments of specialization in the subject.

(iii) Identify chemistry related problems, analysis and application of data using appropriate methodologies.

(iv) Apply subject knowledge and skill to solve complex problems with defined solutions.

(v) Find opportunity to apply subject-related skill for acquiring jobs and self employment.

Programme Specific Outcomes:

On successful completion of the **B.Sc Chemistry** Programme students are able to:

(i) Understand new frontiers of knowledge in chemistry for professional development.

(ii) Apply subject knowledge for solving societal problems related to application of chemistry in day to day life.

(iii) Develop industry focused skills to lead a successful career.

(iv).Express proficiency in oral and written communications to appreciate innovation in research.

Structure of I Semester II semester syllabus under CBCS

YEAR	SEMESTER	COURSE	TITLE	MARKS	CREDITS
I	I	I	Inorganic and Physical Chemistry	100	03
			Practical – I Analysis of SALT MIXTURE	50	02
	I I	II	Organic and General Chemistry	100	03
			Practical – IIVolumetric Analysis	50	02

SEMESTER-I

Course- I (Inorganic & Physical Chemistry) 60hrs (4hrs/w)

Course outcomes : At the end of the course ,the student will be able to ;

1. Understand the basic concepts of p-block elements
2. Explain the difference between solid ,liquid and gases in terms of intermolecular interactions.
3. Apply the concepts of gas equations ,pH and electrolytes while studying other chemistry cou

INORGANIC CHEMISTRY 24 h

UNIT - I

Chemistry of p-block elements

8 h

Group-13 : Preparation & Structure of Diborane ,Borazine
Group -14 : Preparation ,classification and uses of Silicones.
Group15 : Preparation Structures of Phosphonitrilic halides {(PNCl2)n where n=3, 4}
Group:16 : Classification of Oxides and Oxo acids of sulphur (Structure only)
Group:17 : Pseudohalogens ,structures of Interhalogen compounds
Reference : Advanced inorganic Chemistry - Dr.S.K.Agarwala
Chemistry for degree students by Dr.R.L.Madan

UNIT - II

1.Chemistry of d-Block elements :

6h

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.

2. Chemistry of f- block elements : **6h**

Chemistry of lanthanides - electronic structure , oxidation States , Lanthanide contraction, Consequences of Lanthanide contraction , magnetic properties . chemistry of actinides - electronic configuration , Oxidation States , actinide contraction , Seperation of lanthanides and actinides(Ion exchange method) .

Reference : Inorganic chemistry by Gurudeep raj

3. Theories of Bonding in metals : **4h**

Valence bond theory and Free electron theory , explanation of thermal and electrical conductivity of metals based on these theories , Band theory - formation of bands, explanation of conductors , semiconductors and their classification and insulators .

Reference : Advanced inorganic Chemistry - Dr.S.K.Agarwala

PHYSICAL CHEMISTRY 36h

UNIT- III

Solistate **10h**

Symmetry in crystals ,Law of constancy of interfacial angles, The Law of rationality of Indices ,The Laws of symmetry ,Miller indices ,Definition of lattice point, space lattice,Unit cell.Bravais Lattices and crystal systems.X-ray diffraction and crystal structure ,Bragg's Law ,powder method Defects in crystals , stoichiometric and non-stoichiometric crystal defects.

References: physical chemistry by Rakesh bharadwaj

A text book of Physical chemistry for B.sc students by Dr.Haq nawaz Bhatti

UNIT-IV

1.Gaseoustate **6h**

Vander waal's equation of state , Andrew's Isotherms of carbon dioxide ,Continuity of state ,Critical phenomenon ,Relation between critical constants and Vander waal's constants ,Law of Corresponding states ,Joule thomson effect ,Inversion temperature.

2.LiquidState **4h**

Liquid crystals ,Mesomorphic state ,Differences between liquid crystals and solid/liquid, Classification of liquid crystals into smectic ,nematic and cholesteric liquid crystals, Application of liquid crystals as LCD Devices.

References: Chemistry for degree students by Dr.R.L.Madan

UNIT- V

Solutions, Ionic equilibrium & dilute solutions

1.Solutions **6h**

Azeotropes- HCl-H2O system and ethanol-water system. Partially miscible liquids-phenol- water system. Critical solution temperature (CST), Effect of impurity on consolute temperature. Immiscible liquids and steam distillation. Nernst Distribution law. Calculation of the partition coefficient. Applications of distribution law.

2.Ionicequilibrium **3h**

Ionic product, common ion effect, solubility and solubility product and their applications. Calculations based on solubility product.

3.Dilute solutions **7h**

Colligative properties- RLVP, Osmotic pressure, Elevation in boiling point and depression in freezing point. Experimental methods for the determination of molar mass of a non-volatile solute using osmotic pressure, Elevation in boiling point and depression in freezing point. Abnormal colligative properties. Van't Hoff factor.
References: Chemistry for degree students by Dr.R.L.Madan

Co-curricular activities and Assessment Methods

1. Continuous Evaluation: Monitoring the progress of student's learning
2. ClassTests,Worksheets andQuizzes
3. Presentations, Projects and Assignments and Group Discussions: Enhances critical thinking skills and personality Semester-end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.

List of Reference Books

1. Principles of physical chemistry by Prutton and Marron
2. Solid State Chemistry and its applications by Anthony R. West
3. Text book of physical chemistry by K L Kapoor
4. Text book of physical chemistry by S Glasstone
5. Advanced physical chemistry by Bahl and Tuli
6. Inorganic Chemistry by J.E.Huheey
7. Basic Inorganic Chemistry by Cotton and Wilkinson
8. A textbook of qualitative inorganic analysis by A.I. Vogel
9. Atkins, P.W. & Paula, J. deAtkin'sPhysicalChemistryEd.,OxfordUniversityPress 10thEd(2014).
10. Castellan, G.W.PhysicalChemistry4thEd.Narosa (2004).
11. Mortimer,R. G.PhysicalChemistry3rdEd. Elsevier:NOIDA,UP(2009).
12. Barrow, G.M.PhysicalChemistry

Theory of Internal Assessment

Internal (mid Test average)	Assignments	Attendance	Seminar	Project	Total
10M	10M	05M	05M	10M	40M

LABORATORY COURSE -I 30hrs (2h/w)

Practical-I

Analysis of Salt Mixture (At the end of semester-I)

Qualitative inorganic analysis (Minimum of six mixtures should be analysed) 50M

Course out comes :

At the end of the course student will be able to;

1. understand the basic concepts of qualitative analysis of inorganic mixture.
2. Use glassware ,equipment and Chemicals and follow experimental procedures in the laboratory.
3. Apply the concepts of common Ion effect, solubility product and concepts related to qualitative analysis.

ANALYSIS OF SALT MIXTURE 50Marks

Analysis of mixture salt containing two anions and two cations (From two different groups) From following

Anions: Carbonate, Sulphate, Chloride, Bromide, Acetate, Nitrate, Borate,Phosphate.

Cations: Lead, Copper, Iron, Aluminium, Zinc, Nickel, Manganese, Calcium, Strontium, Barium,

Potassium and Ammonium.

Practical scheme of valuation

Time : 3hrs

Marks: 25

Scheme for External Examination

Systematic procedure should be adopted :

Breakup of marks :

Part- A Preliminary Tests

Colour and appearance & Odour - 1M

Solubility -1M

Action of Heat - 1M

Part-B Test for each anion -4M

Two Anions 2 x 4 = 8M (Dry test with acids - 2m + Confirmation with extract -4M)

Sodium carbonate Extract preparation -2M

Part- C

Test for each Cation - 5M

Two cations - 2 x 5 =10M

Break up of 5 marks for each cation

Identification of correct group in separation - 1M

Colour of the precipitate - 1M

General group separation table - 1M

Confirmation test in the group - 2M

For ammonium Cation

Test with NaOH - 2M

Test with Nessler's reagent - 3M

Part - D

Report for two Anions & two cations - 2M

Total Marks - 25 Marks

Internal assessment for Practical

Record	Project/viva	Fieldnotes /field trip	Total
10 M	10M	05M	25M

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B.Sc Chemistry ,Course -I,semester -I
Blueprint

S.No	Units	Name of the chapter	8M	4M
		Inorganic chemistry		
1	Unit-I	Chemistry of p-block elements	2	1
2	Unit- II	Chemistry of d &f-blockelements ,Theory of bonding in metals	2	2
		Physical chemistry		
3	Unit-III	Solid state	2	1
4	Unit-IV	Gaseous state Liquid state	1 1	1 1
5	Unit-V	Solutions ,ionic equilibrium Dilute solutions	2	2

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MODEL PAPER

DEPARTMENT OF CHEMISTRY

SRR & CVR Govt . Degree College(A)Vijayawada ,Andhrapradesh,INDIA

(NAAC B+ (III Cycle with CGPA -2.6 & District Identified college)

FIRST YEAR B.Sc., DEGREE EXAMINATION

SEMESTER-I

CHEMISTRY Course-1: INORGANIC & PHYSICAL CHEMISTRY

Time: 3 hours **Maximum Marks: 60**

PART- A **5 X 4 = 20 Marks**

Answer any FIVE of the following questions. Each carries **FIVE** marks

ఏవైనా ఐదు ప్రశ్నలకు సమాధానములు వ్రాయుము.ప్రతి ప్రశ్న కు 5 మార్కులు

1. Explain the preparation & structures of Phosphonitrilic compounds.

ఫాస్ఫో నిట్రోలిక్ సమ్మేళనాల తయారీ మరియు నిర్మాణాన్ని వివరింపుము.

2. Explain in brief, catalytic properties & stability of various oxidation states of d- block elements.

3. d -బ్లాక్ మూలకాల ఉత్ప్రేరక మరియు వివిధ రకాల ఆక్షీకరణ స్థితుల యొక్క స్థిరత్వాన్ని వివరింపుము.

3. Write short note on Bravais lattices and crystal systems.

బ్రావెస్ జాలకాలు మరియు స్ఫటిక వ్యవస్తలు గురించి లఘు వ్యాఖ్య వ్రాయుము.

4. What are Smectic&Nematic liquid Crystals? Explain.

స్మెక్టిక్ మరియు నెమటిక్ ద్రవ స్ఫటికాలు అంటే ఏమిటి? వివరింపుము.

5. Write account on Common ion effect & Solubility product.

ఉమ్మడి అయాన్ ప్రభావము మరియు ద్రావణీయత లబ్ధం ను గూర్చి వ్రాయుము.

6. Describe Andrew's isotherms of carbon dioxide.

కార్బన్ డయాక్సైడ్ యొక్కఆండ్రూస్ సమ ఉష్ణోగ్రత రేఖ లను వివరింపుము.

7. Explain Actinide Contraction.

20 V. Neeraja

బోరజీన్ నిర్మాణం ను వివరించుము

8. Explain the structure of Borazineబోరజీన్ నిర్మాణాన్ని వివరించుము.

PART- B **5X 8 = 40 Marks**

Answer ALL the questions. Each carries EIGHT marks

ఈ క్రింది అన్ని ప్రశ్నలకు సమాధానములు వ్రాయుము ప్రతి ప్రశ్న కు 10 మార్కులు.

9 (a). Explain Classification, Preparations & uses of Silicones

సిలికోన్ ల వర్గీకరణ,తయారీ మరియు అనువర్తనాలను వివరించుము.

(or)

(b).(i) What are Pseudohalogens. నకిలీ హాలోజన్ లు అనగానేమి?

(ii) Explain the Structures of any one AX3& AX5interhalogen compounds.

AX_3& AX_5 అంతర హాలోజన్ సమ్మేళనాల నిర్మాణాన్ని వివరించుము.

10 (a). What is Lanthanide Contraction? Explain the Consequences of Lanthanide Contraction.

లాంథనైడ్ సంకోచం అనగానేమి? లాంథనైడ్ సంకోచం యొక్క పర్యవసానాలను వివరించుము.

(or)

(b). (i) Explain the magnetic properties of d- block elements.

d బ్లాక్ మూలకాల యొక్క అయస్కాంత ధర్మాలను వివరించుము.

(ii) Explain about Conductors, Semi-Conductors& Insulators using BandTheory.

వాహకాలు,అర్ధ వాహకాలు మరియు నిరోధకాలను పట్టీ సిద్ధాంతమును ఉపయోగించి వివరించుము.

11.(a). Write an essay on Crystal defects.

స్ఫటిక లోపాలను గూర్చి వివరించుము.

(or)

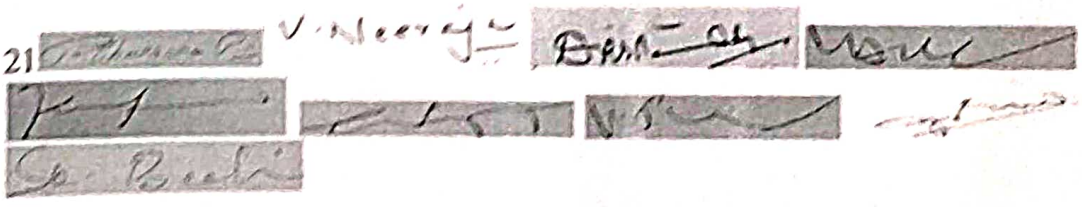
(b) What is Bragg's Law. Explain the determination of structure of a crystal by powder method.

బ్రాగ్ సమీకరణం ను వివరించుము పొడి పద్ధతి ద్వారా స్ఫటికము యొక్క నిర్మాణాన్ని ఏ విధముగా నిర్ణయిస్తారు?

12.(a). Derive the relationship between Critical constants &Vanderwaal constants

వాండర్ వాల్ స్థిరాంకాలు,క్రిటికల్ స్థిరాంకాలకు మధ్య సంబంధము ను ఉత్పాదించుము.

(or)

21 

(b).(i) Write any 5 differences between liquid crystals & liquids
ద్రవ స్ఫటికాలు మరియు ద్రవ,ఘన పదార్థాల మధ్య ఏవైనా 5 బేధాలను వివరింపుము.

(ii) Write the applications of Liquid crystals.
ద్రవ స్ఫటికాల అనువర్తనాలను వివరింపుము.

13.(a). Explain Nernst distribution Law. Explain its applications
నెర్నస్ట్ వితరణ నియమమును వ్రాయుము.అనువర్తనాలను వివరింపుము

(or)

(b). What are colligative properties. Write experimental methods for determination of molar mass of a non-volatile solute by using Elevation in boiling point & depression in freezing point.
కణదార ధర్మాలను నిర్వచింపుము? ఘనీభవన స్థాన నిమ్నత మరియు భాస్పీభవన స్థాన ఉన్నతి ని ఉపయోగించి ఒక అభాస్పశీల ద్రావిత పదార్థ మోలార్ ద్రవ్యరాశిని ప్రయోగికము గా నిర్ణయిస్తారు?

Department of Chemistry - Semester -I Question bank

Short questions- 4 marks

1. Explain the preparation and structures of phosphonitrilic compounds
2. Explain the structure of Diborane .
3. Write a short note on pseudo halogens.
4. Explain the structure of sulphurous acid & sulphuric acid
5. Explain in brief catalytic properties and stability of various oxidation States of d- block elements.
6. Write a short note on actinide contraction .
7. Explain valency bond theory and free electron theory.
8. Write a short note on Bravais lattices
9. Define law of constancy of interfacial angle.
10. Derive bragg's law.
11. write a short note on weiss indices and Miller Indices.
12. Explain last corresponding States.
13. Explain the Joule thomson effect.
14. Write a short note on Inversion temperature.
15. Explain applications of liquid crystals.
16. Write an account on solubility product and common Ion effect.
17. Explain Nernst distribution law.
18. Write a short note on Van't Hoff factor.
19. write a short note on'relative lowering of vapour pressure

20. write a short note on Azeotrope mixture

Essay Questions -8Marks

1. Explain classification , preparation & uses of silicones.
2. What are pseudo halogens text line The structures of of anyone AX3 andAX5 Inter halogen compounds.
3. What is Lanthanide contraction. Explain the consequences of Lanthanide contraction.
4. explain the magnetic properties of d- block elements. Explain about conductors semiconductors and insulators using Band theory.
5. Write an essay on crystal defects.
6. what is bragg's law.Explain determination of structure of a crystal bye powder method.
7. Derive the relation between Vanderwaal constants and Critical constants .
8. write an essay on Andrew's isotherm of carbon dioxide.
9. Write any two differences between liquid crystal and liquids ,solids .Explain The Classification of liquid crystals.
10. Write experimental methods for determination of molar mass of a non volatile solute by using Elevation in boiling point and Depression in freezing point

SRR & CVR Govt.Degree college (A)

(NAAC Reaccredited B+ Grade Institution(III cycle with CGPA 2.60 & District Identified College)

Vijayawada- 5320 004, Andhra Pradesh, INDIA

SEMESTER – II

Course II – (Organic & General Chemistry) 60 hrs (4h/w)

Course outcomes:

At the end of the course, the student will be able to;

a) Understand and explain the differential behavior of organic compounds based on fundamental concepts learnt.

b) Formulate the mechanism of organic reactions by recalling and correlating the fundamental Properties of the reactants involved.

c) Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.

d) Correlateanddescribethestereochemicalpropertiesoforganiccompoundsand reactions.

ORGANIC CHEMISTRY **36h**

UNIT-I

Recapitulation of Basics of Organic Chemistry

Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes) **12h**

General methods of preparation of alkanes- Wurtz and WurtzFittig reaction, Corey House synthesis,

physical and chemical properties of alkanes, Isomerism and its effect on properties, Free radical

substitutions; Halogenation(Mechanism), Conformational analysis

of alkanes (Conformations, relative stability and energy diagrams of ethane and butane).

General molecular formula of cycloalkanes and relative stability, Baeyer strain theory, Cyclohexane

Conformations with energy profile diagram.

References: Chemistry for degree students by Dr.R.L.Madan

UNIT-II

Carbon-Carbon pi Bonds (AlkenesandAlkynes) **12h**

General methods of preparation, physical and chemical properties. Mechanism of E1, E2, reactions, Saytzeff Rule, Electrophilic Additions, mechanism (Markownikoff/Antimarkownikoff addition)with suitable examples,, *syn and anti-addition*; addition of H_2, X_2, HX. Oxymercuration- demercuration, hydroboration-oxidation,ozonolysis,hydroxylation,

Diels Alder reaction,1,2- and1,4-addition reactions in conjugated dienes. Reactions of alkynes; acidity,

electrophilic and nucleophilic additions, hydration to form carbonyl compounds, Alkylation of terminal alkynes.

References: Chemistry for degree students by Dr.R.L.Madan

UNIT-III

Benzene and its reactivity **12h**

Concept of aromaticity, Huckel's rule - application to Benzenoid (Benzene, Naphthalene and Anthracene) and Non - Benzenoid compounds (cyclopropenylcation, cyclopentadienyl anion and tropylium cation)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 groups. Ring activating and deactivating groups with examples (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)

References: Chemistry for degree students by Dr.R.L.Madan

GENERAL CHEMISTRY **24 h**

UNIT-IV

1. Surface chemistry and chemical bonding

Surface chemistry **6h**

Colloids- Coagulation of colloids- Hardy-Schulze rule. Stability of colloids,Protection of Colloids, Gold number.

Adsorption-Physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption.

2. Chemical Bonding **6h**

Valence bond theory, hybridization, VB theory as applied toClF_3, $Ni(CO)_4$, Molecular orbital theory -LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N_2, O_2, CO and NO).

3. HSAB **2h**

Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.

References: Chemistry for degree students by Dr.R.L.Madan

UNIT-V

Stereochemistry of carbon compounds **10h**

Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae.

Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation.

Chiral molecules- definition and criteria(Symmetry elements)- Definition of enantiomers and diastereomers – Explanation of optical isomerism with reference to Lactic acid and Tartaric acid Further examples- Glyceraldehyde, Alanine, 2,3-dibromopentane. D,L, R,S and E,Z- configuration with examples. Definition of Racemic mixture – Resolution of racemic mixtures (any 3 techniques)

References: Chemistry for degree students by Dr.R.L.Madan

Co-curricular activities and Assessment Methods

Continuous Evaluation: Monitoring the progress of student's learning Class Tests, Worksheets and Quizzes. Presentations, Projects and Assignments and Group Discussions: Enhances critical thinking skills and personality. Semester-end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.

List of Reference Books Theory:

Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (PearsonEducation).
Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
Eliel, E. L. &Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994. Kalsi, P. S. Stereochemistry Conformation and Mechanism; New Age International, 2005.

Practical:

Ahluwalia, V.K. &Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
Ahluwalia, V.K. &Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)

Additional Resources:

Solomons, T. W. G.; Fryhle, C. B. &Snyder, S. A. Organic Chemistry, 12th Edition, Wiley. Bruice, P. Y. Organic Chemistry, Eighth Edition, Pearson.

Clayden, J.; Greeves, N.&Warren, S. Organic Chemistry, Oxford.

Nasipuri, D. Stereochemistry of Organic Compounds: Principles and Applications, Third Edition, NewAge International.

Gunstone, F. D. Guidebook to Stereochemistry, Prentice Hall Press, 1975.

Theory of Internal Assessment

Internal (mid Test average)	Assignments	Attendance	Seminar	Project	Total
10M	10M	05M	05M	10M	40M

LABORATORY COURSE-II

30hrs (2 h / w)

Practical-II Volumetric Analysis

(At the end of Semester-II)

Course outcomes:

At the end of the course, the student will be able to;

1. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory.
2. Understand and explain the volumetric analysis based on fundamental concepts learnt in ionic equilibria
3. Learnandidentifythe concepts of a standard solutions, primary and secondary standards
4. Facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

Volumetric analysis **50 M**

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
2. Determination of Fe (II) using $KMnO_4$ with oxalic acid as primary standard.
3. Determination of Cu (II) using $Na_2S_2O_3$ with $K_2Cr_2O_7$ as primary standard.
4. Estimation of water of crystallization in Mohr's salt by titrating with $KMnO_4$

Practical External scheme of valuation

Time : 3 hrs **Practical Marks : 25 M**

Titrimetric analysis (25 M) :

1.Systamatic procedure : 05

2.Balanced chemical equation : 02

3.Table with details : 03

4.Burette reading : Error of < 1 % = 10 M, Error of 1 to 2 % = 7 M, Error of > 3% = 3 M

5.Calculations : 03 M

6. Result : 02 M

Internal assessment for Practical

Record	Project/viva	Fieldnotes /field trip	Total
10 M	10M	05M	25M

30

B.Sc Chemistry ,Course -I,semester -II
Blueprint

S.No	Units	Name of the chapter	8M	4M
		Organic chemistry		
1	Unit-I	Carbon-Carbon sigma bonds	2	1
2	Unit- II	Carbon-carbon Pi bonds	2	2
3	Unit-III	Benzene and its reactivity	2	1
		General chemistry		
4	Unit-IV	Surface chemistry & Chemical bonding	1 1	1 1
5	Unit-V	Stereochemistry of carbon compounds.	2	2

SRR & CVR GOVT.DEGREE COLLEGE(A)

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MODEL PAPER
FIRST YEAR B.Sc., DEGREE EXAMINATION
SEMESTER-II
CHEMISTRY COURSE -II: ORGANIC & GENERAL CHEMISTRY

Time: 3 hours | Maximum Marks: 60

PART- A | 5 X 4 = 20 Marks

Answer any **FIVE** of the following questions. Each carries **Four** marks
ఏవైనా ఐదు ప్రశ్నలకు సమాధానములు వ్రాయుము.ప్రతి ప్రశ్న కు 5 మార్కులు

1. Write different conformations of n-butane. Explain their relative stability.
   n బ్యూటేన్ వివిధ అనురూపకాలను వ్రాయుము. వాటి స్థిరత్వం ను వివరింపుము.
2. Explain 1,2- & 1,4- addition reactions of conjugated dienes.
   సంయుగ్మ డైన్ ల 1,2 &1,4- సంకలన చర్యలను వివరింపుము.
3. Explain the orientation effect of halogens on mono substituted benzene.
   ఏక ప్రతిక్షేపణ బెంజీన్ లో హాలోజన్ ల స్థాన నిర్దేశకత ను వివరింపుము.
4. Explain the mechanism of $E1^{CB}$ elimination reaction.
   $E1^{CB}$ విలోపన చర్య యొక్క చర్య విధానాన్ని వివరింపుము.
5. Explain the structure of ClF_3 by Valency Bond theory.
   ClF_3 అణువు నిర్మాణాన్ని వేలన్సీ బంధ సిద్ధాంతము ద్వారా వివరింపుము.
6. What are Hard & soft acids & bases? Explain with examples.
   కఠిన , మృదు ఆమ్లాలు మరియు క్షారాలు అనగానేమి?ఉదాహరణ లతో వివరింపుము.
7. Draw the Wedge, Fischer, Newmann& saw-Horse representations for Tartaric acid.
   టార్టారిక్ ఆమ్లం యొక్క వెడ్జ్ ,ఫిషర్, న్యూమన్ మరియు సాహోర్స్ నిర్మాణాలను వ్రాయుము.
8. Define Enantiomers and Diastereomers and give two examples for each.
   ఎనాన్సయోమెర్స్ మరియు డయోస్టీరియోమెర్స్ నిర్వచింపుము మరియు రెండు

ఉదాహరణలిమ్ము.

PART- B 5 X 8 = 40 Marks

Answer **ALL** the questions. Each carries **EIGHT** marks
ఈ క్రింది అన్ని ప్రశ్నలకు సమాధానములు వ్రాయుము.ప్రతి ప్రశ్న కు 10 మార్కులు.

9 (a). (i) Write the preparation of alkanes by Wurtz and Corey-House reaction.
వుర్ట్జ్ మరియు కోర్ హౌస్ చర్యల నుండి అల్కేన్ తయారీ ని వ్రాయుము.

(ii) Explain Halogenation of alkanes. Explain the reactivity and selectivity in free radical substitutions.
అల్కేన్ హాలోజినేషన్ ను వివరింపుము.స్వేచ్ఛా ప్రాతిపదికల ప్రతిక్షేపన చర్యల చర్యాశీలత మరియు సేలెక్టివిటి ను వివరింపుము.

(or)

(b). (i) Explain Baeyer Strain Theory
బేయర్ ప్రయాస సిద్ధాంతమును వివరించుము.

(ii) Draw the conformations of Cyclohexane and explain their stability by drawing energy profile diagram.
సైక్లోహెక్సేన్ అనురూపకాలను గీయుము మరియు వాటి స్థిరత్వమును శక్తిస్థాయి చిత్రం ద్వారా వివరింపుము.

10 (a). (i) Write any two methods of preparation of alkenes.
ఆల్కీన్ ల ఏవైనా రెండు తయారు చేయు పద్ధతులు ను వ్రాయుము.

(ii) Explain the mechanism of Markownikiff and Anti-Markownikoff addition of HBr to alkene.
ఆల్కీన్ తో HBr సంకలన చర్య యొక్క మార్కోనికాఫ్ మరియు ఆంటి మార్కోనికాఫ్ చర్య విధానమును వివరింపుము.

(or)

(b). (i) Explain the acidity of 1-alkynes
1- అల్కైన్ యొక్క ఆమ్లత్వాన్ని వివరింపుము.

(ii) How will you prepare acetaldehyde and acetone from alkynes?

అల్కైన్ ల ను అసిటాల్డిడ్ మరియు అసిటోన్ నుండి ఎలా తయారు చేస్తారు?

(iii) Write alkylation reaction of terminal alkne.

టర్మినల్ అల్కైన్ ల ఆల్కిలేషన్ చర్య ను వ్రాయుము.

11.(a). Define Huckel rule of aromatic compounds. What are benzenoid and non- benzenoid aromatic compounds? Give examples.

ఆరోమాటిక్ సమ్మేళనాల హుకెల్ నియమమును నిర్వచించుము.బెంజనాయిడ్ మరియు నాన్ బెంజనాయిడ్ ఆరోమాటిక్ సమ్మేళనాల ను ఉదాహరణ ల తో వివరింపుము.

(or)

(b). Explain the mechanisms of Nitration and Friedel-Craft's alkylation of Benzene.

బెంజీన్ యొక్క నైట్రేషన్ మరియు ఫ్రీడల్ క్రాఫ్ట్స్ ఆల్కిలేషన్ చర్య ల చర్య విధానంతో వివరింపుము.

12.(a). (i) Define Hardy-Schulze rule & Gold number.

గోల్డ్ సంఖ్య మరియు హార్డీ షూల్జి నియమమును నిర్వచించుము.

(ii) Differentiate Physisorption& Chemisorption. Explain Langmuir adsorption isotherm.

భౌతిక అధిశోషణము,రసాయన అధిశోషణము భేదాలు ను వ్రాయుము.లాంగ్ మ్యూర్ అధిశోషణ సమ ఉష్ణోగ్రత సిద్ధాంతమును వివరింపుము.

(or)

(b). Construct the Molecular Orbital diagram for O_2 and NO and explain their bond order and magnetic property.

O_2 మరియు NO అణువుల బంధ క్రమమును మరియు అయస్కాంత ధర్మాలను వ్రాయుము.

13.(a). Define racemic mixture. Explain any two techniques for resolution of racemic mixture.

రెసిమిక్ మిశ్రమము ను నిరవచించుము. రెసిమిక్ మిశ్రమము యొక్క పృధక్కరణ ను రెండు పద్ధతులను తెలుపుము.

(or)

(b).(i) Define Optical activity and Specific rotation.
ధృవణశీలత మరియు విశిష్ట భ్రమణం ను నిర్వచించుము.

(ii) Draw the R- & S- isomers of Alanine, Glyceraldehyde.
అలనైన్, గ్లిసరాల్డిహైడ్ యొక్క R, S నిర్మాణాలను గీయుము.

(iii) Write the E- & Z- isomers of 2-butene.
2- బ్యూటిన్ E మరియు Z నిర్మాణాలను వ్రాయుము.

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SRR & CVR GOVERNMENT DEGREE COLLEGE(A), VIJAYAWADA

CHEMISTRY SYLLABUS FOR SEMESTER - III

Paper III (INORGANIC & ORGANIC CHEMISTRY) **60 hrs (4 h / w)**

INORGANIC CHEMISTRY **30 hrs (2h / w)**

UNIT –I

1. Chemistry of d-block elements: **9h**

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

2. Theories of bonding in metals: **6h**

Metallic properties and its limitations, Valence bond theory, Free electron theory, Explanation of thermal and electrical conductivity of metals, Band theory, formation of bands, explanation of conductors, semiconductors and insulators.

Reference books : 1. Advanced Inorganic chemistry by Gurudeep Raj

2. Basic Inorganic Chemistry by Cotton and Wilkinson

3. Concise Inorganic Chemistry by J.D.Lee

UNIT – II

3.Metal carbonyls : **7h**

EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls of V, Cr, Mn, Fe, Co and Ni.

4. Chemistry of f-block elements: **8h**

Chemistry of lanthanides - 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.

Reference books : 1. Selected topics in inorganic chemistry by W.D.Malik, G.D.Tuli,R.D.Madan

2. Inorganic Chemistry J E Huheey, E A Keiter and R L Keiter

ORGANIC CHEMISTRY 30 h (2h/w)

UNIT – III

1. Halogen compounds **5 h**

Nomenclature and classification of alkyl (into primary, secondary, tertiary), aryl, aryl alkyl, allyl, vinyl, benzyl halides.

Nucleophilic aliphatic substitution reaction- classification into SN^1 and SN^2 – reaction mechanism with examples – Ethyl chloride, t-butyl chloride and optically active alkyl halide 2-bromobutane.

2. Hydroxy compounds **5 h**

Alcohols: Preparation with hydroboration reaction, Grignard synthesis of alcohols. Phenols: Preparation i) from diazonium salt, ii) from aryl sulphonates, iii) from cumene.Identification of alcohols by oxidation with $KMnO_4$, Luca's reagent and phenols by reaction with $FeCl_3$.

Chemical properties: a) Dehydration of alcohols. b) Oxidation of alcohols by CrO_3, $KMnO_4$.

c) Special reaction of phenols: Bromination, Kolbe-Schmidt reaction, Riemer-Tiemann reaction, Fries rearrangement, azo coupling, Pinacol-Pinacolone rearrangement.

Reference books : 1. A Text Book of Organic Chemistry by Bahl and Arun bahl

UNIT-IV

Carbonyl compounds **10 h**

Synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties: Reactivity of carbonyl group in aldehydes and ketones.

Nucleophilic addition reaction with a) $NaHSO_3$, b) HCN c) RMgX d) NH_2OH e)$PhNHNH_2$ f) 2,4 DNPH g) Alcohols-formation of hemiacetal and acetal. Base catalysed reactions: a) Aldol condensation, b) Cannizzaro's reaction, c) Perkin reaction, d) Benzoin condensation, e) Haloform reaction, f) Knoevenagel

reaction. Oxidation of aldehydes- Baeyer-Villiger oxidation of ketones.Reduction: Clemmensen reduction, Wolf-Kishner reduction, MPV reduction, reduction with $LiAlH_4$ and $NaBH_4$. Analysis of aldehydes and ketones with a) 2,4-DNPH test, b) Tollen's test, c) Fehling test, d) Schiff's test e) Haloform test (with equation)

Reference books : 1. A Text Book of Organic Chemistry by Bahl and Arun bahl

2. A Text Book of Organic chemistry by I L Finar Vol

3. Organic chemistry by Bruice

UNIT-V

1. Carboxylic acids and derivatives **6 h**

Methods of preparation by a) Hydrolysis of nitriles, amides b) Hydrolysis of esters by acids and bases with mechanism c) Carbonation of Grignard reagents. Special methods of preparation of aromatic acids by a) Oxidation of side chain. b) Hydrolysis by benzo trichlorides. c) Kolbe reaction. **Physical properties**: Hydrogen bonding, dimeric association, acidity- strength of acids with examples of trimethyl acetic acid and trichloroacetic acid. Relative differences in the acidities of aromatic and aliphatic acids. **Chemical properties**: 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, decarboxylation by Schimdt reaction, Arndt-Eistert synthesis, halogenation by Hell- Volhard- Zelinsky reaction.

2. Active methylene compounds **4 h**

Acetoacetic ester: keto-enol tautomerism, preparation by Claisen condensation, Acid hydrolysis and ketonic hydrolysis. Preparation of a) monocarboxylic acids. b) Dicarboxylic acids. c) Reaction with urea

Malonic ester: 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.

Reference books : 1. Organic chemistry by Bruice

2. Organic chemistry by Clayden

List of Reference Books :

1. Selected topics in inorganic chemistry by W.D.Malik, G..D.Tuli,R.D.Madan
2. Inorganic Chemistry J E Huheey, E A Keiter and R L Keiter
3. A Text Book of Organic Chemistry by Bahl and Arun bahl
4. A Text Book of Organic chemistry by I L Finar Vol I
5. Organic chemistry by Bruice
6. Organic chemistry by Clayden

7. Advanced Inorganic chemistry by Gurudeep Raj
8. Basic Inorganic Chemistry by Cotton and Wilkinson
9. Concise Inorganic Chemistry by J.D.Lee

Theory Internal Assessment

Internal (Mid tests average)	Assignments	Attendance	Seminar	Project	Total
10 M	10 M	05 M	05 M	10 M	40 M

LABORATORY COURSE -III

Syllabus for Practical Paper-III **45hrs (3 h / w)**

Titrimetric analysis and **Organic Functional Group Reactions** (At the end of Semester-III)

Titrimetric analysis: **15 M**

1.Determination of Fe (II) using $KMnO_4$ with oxalic acid as primary standard.

2. Determination of Cu(II) using $Na_2S_2O_3$ with $K_2Cr_2O_7$ as primary standard.

Organic Functional Group Reactions **10 M**

3. Reactions of the following functional groups present in organic compounds

(at least four) Alcohols, Phenols, Aldehydes, Ketones, Carboxylic acids and Amides

Practical scheme of valuation

Time : 3 hrs **Practical Marks : 25 M**

Titrimetric analysis (15 M) :

1.Systamatic procedure : 02

2.Balanced chemical equation : 01

3.Table with details : 01

4.Burette reading : Error of < 1 % = 8 M, Error of 1 to 2 % = 7 M, Error of > 3% = 3 M

5.Calculations : 02 M

6. Result : 01 M

Organic functional group tests (10 M) :

1.Identification of functional group by two simple tests : 2 x 3 = 6 M

2. Confirmatory test for functional group : 03 M

3. Reporting the functional group : 01 M

Internal assessment for Practical

Record	Project + Viva	Field notes/Field trip	Total
10 M	10 M	05 M	25 M

SRR & CVR GOVT. DEGREE COLLEGE- VIJAYAWADA (AUTONOMOUS)

SEMESTER – III

Paper III (Inorganic and Organic Chemistry)

Weightage to Content

Unit No	Name of the Chapter	Essay (8M)	Short (4M)
Unit - I	Chemistry of d – block elements	1	1
	Theory of bonding in metals	1	1
Unit – II	Metal Carbonyls	1	1
	Chemistry of f – block elements	1	1
Unit – III	Halogen Compounds	1	1
	Hydroxy Compounds	1	1
Unit - IV	Carbonyl Compounds	2	2
Unit - V	Carboxylic Acids & derivatives	1	1
	Active methylene compounds	1	1

SRR & CVR GOVT. DEGREE COLLEGE - VIJAYAWADA (AUTONOMOUS)
II B.Sc Chemistry SEMESTER – III
Paper III (Inorganic and Organic Chemistry)
Model Paper

Time : 3 hrs **Max. Marks : 60 M**

SECTION – A

Answer any Five questions from the following. **5 x 4 = 20 M**

క్రింది వానిలో ఏవైనా అయిదు ప్రశ్నలకు సమాధానములు వ్రాయుము

1. What are d- block elements ? Give the electronic configuration of 3d transition series ?

d - బ్లాక్ మూలకాలనగా నేమి? 3d శ్రేణి మూలకాల ఎలక్ట్రానిక్ విన్యాసములు వ్రాయుము ?

2. Write a short note on semiconductors and insulators ?

అర్ధ వాహకాలు & అధమవాహకాలు అనగానేమి ?

3. What is EAN rule ? Give two examples ?

EAN అనగానేమి ? రెండు ఉదహరణలు వ్రాయుము ?

4. Give the differences between Lanthanides and Actinides ?

లాంథనైడ్లు & ఆక్టినైడ్లు మధ్య భేదములు తెలుపుము ?

5. Allyl halides are more reactive than vinyl halides. Explain ?

వినైల్ హాలైడ్లు కన్నా ఏలయిల్ హాలైడ్లు అధిక చర్యాశీలత కలవి. ఎందువలన ?

6. Give any two methods of preparation of Phenols ?

ఫినోల్ యొక్క ఏవైనా రెండు తయారు చేయు విధానములు వ్రాయుము ?

7. Write any two methods of preparations of ketones ?

కీటోన్ల యొక్క ఏవైనా రెండు తయారు చేయు విధానములు వ్రాయుము ?

40 [redacted]

8. Give any two tests of aldehydes?

అల్డేహైడ్లు యొక్క ఏవైనా రెండు పరీక్షలు వ్రాయుము ?

9. Write short note on Kolbe reaction ?

కొల్బే చర్య గూర్చి లఘు వ్యాక్య వ్రాయయు ?

10. How is Malonic ester synthesized from acetic acid ?

అసిటిక్ ఆమ్లం నుండి మలోనిక్ ఎస్టర్ తయారు చేయు విదానము వ్రాయుము ?

SECTION – B

Answer all questions from the following. **5 x 8 = 40 M**

ఈ క్రింది ప్రశ్నలు అన్నింటికీ సమాధానములు వ్రాయయు ?

11. A) Explain the Oxidation state properties and magnetic properties of d – block elements ?

d – బ్లాకు మూలకాల ఆక్సీకరణ ధర్మాలు & ఆయస్కాంత ధర్మాలు వివరించుము ?

OR

B) Explain Free electron theory and Valence bond theory in metals ?

స్వేచ్ఛా ఎలక్ట్రాన్ సిద్ధాంతము & వాలెన్సీ బంధ సిద్ధాంతము లను వివరించుము ?

12. A) Explain the structures of $Ni(CO)_4$ and $Fe(CO)_5$?

$Ni(CO)_4$ & $Fe(CO)_5$ ల నిర్మాణములు వివరించుము ?

OR

B)What is Lanthanide contraction ? Give the cause and consequences of Lanthanide contraction?

లాంథనైడ్ సంకోచం అనగా నేమి ? దానికి కారణములు & పర్యవసానములు తెలుపుము ?

13. A) Write the mechanisms of SN_1 & SN_2 reactions ?

SN_1 & SN_2 చర్యల విధానము వివరించుము ?

OR

C) Write about Riemer – Tiemann and Pinacol - Pincolone rearrangement reactions with mechanisms ?

రీమర్ - టీమాన్ చర్య & పినకాల్ -పినకలోనే పునరామరిక చర్యల విధానము వివరించుము ?

14. A) Explain the mechanisms of Aldol condensation and Cannizaro reaction ?

ఆల్డోల్ సంఘననం & కెన్నిజారో చర్యల విధానము లను వివరించుము ?

OR

B) Write the mechanisms of Clemmensen reduction & Wolf – Kishner reduction ?

క్లేమెన్సన్ క్షయకరణము & వోల్ఫ్- కిషనేర్ క్షయకరణ చర్యల విధానము వివరించుము ?

15. A) Explain HVZ reaction & esterification with mechanism ?

HVZ చర్య & ఎస్టర్ ఏర్పడు చర్య విధానము లను వివరించుము ?

OR

C) Write the mechanism of Claisen condensation ? Write about Keto-enol tautomerism ?

క్లైసన్ సంఘననం యొక్క చర్యవిధానము వ్రాయయు ? కేటో - ఈనోల్ టాటోమెరికరణం గూర్చి వ్రాయుము ?

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SRR & CVR GOVT. DEGREE COLLEGE - VIJAYAWADA (AUTONOMOUS)

II B.Sc Chemistry, Semester – III

Paper III (Inorganic and Organic Chemistry)

Question Bank

Short answer type questions (4M) :

1.Give the electronic configurations of first transition series ?

2.Write the Catalytic properties of d-block elements ?

3.Write short note on Free electron theory ?

4. Explain semiconductors and insulators ?

5.What is EAN ? Give examples ?

6.Explain the structure of $Cr(CO)_6$?

7.Give the differences between Lanthanides and Actinides ?

8. Allyl halides are more reactive than vinyl halides. Explain ?

9. Give any two methods of preparation of Phenols ?

10.Write any two methods of preparations of ketones ?

11.Give any two tests for aldehydes?

12.Write short note on Kolbe reaction ?

13.Explain Schmidt reaction ?

14.How is Malonic ester synthesized from acetic acid ?

Essay type questions(8M) :

11. Explain the properties Oxidation states and magnetic properties of d –block elements ?
12. Explain Band theory and Valence bond theory in metals ?
13. Explain the structures of $Ni(CO)_4$ and $Fe(CO)_5$?
14.What is Lanthanide contraction ? Give the cause and consequences of Lanthanide contraction?
15. Explain the mechanisms of SN_1 & SN_2 reactions ?
16. Write about Riemer – Tiemann and Pinacol - Pincolone rearrangement reactions with mechanisms ?
17.Explain the mechanisms of Aldol condensation and Cannizaro reaction ?
18.Explain the mechanisms of Benzoin condensation & Perkin reaction ?

19.Write the mechanisms of Clemmensen reduction & Wolf – Kishner reduction ?
20. Explain HVZ reaction & esterification with mechanism
21.Write the mechanisms of Huns-Diecker & Arndt-Eistert synthesis ?
22. Write the mechanism of Claisen condensation ? Write about Keto-enol tautomerism ?

SRR & CVR Govt. Degree College (Autonomous), Vijayawada

SEMESTER - V : CHEMISTRY SYLLABUS

Paper V :: INORGANIC, PHYSICAL & ORGANIC CHEMISTRY

Course Outcomes: By the completion of the paper- V syllabi, student will be able to:

- understand the different theories about co-ordination compounds and write the formulas of co-ordination compounds by his/her own
- correlate relation between stability and factors affecting the stability of coordination compounds
- build the idea of Nitrogen based organic compounds and their properties
- Learn the energy changes that could occur in chemical reactions in terms of thermodynamic view

Paper –V: Inorganic, Organic & Physical Chemistry

YEAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS
III	V	V	Inorganic, Organic and Physical Chemistry	100	03
			Practical – V	50	02
		VI	Inorganic, Organic and Physical Chemistry	100	03
			Practical – VI	50	02

SEMESTER-V

CHEMISTRY SYLLABUS FOR SEMESTER - III
Paper - V (INORGANIC, PHYSICAL & ORGANIC CHEMISTRY)
45 hrs (3 h / w)

INORGANIC CHEMISTRY

UNIT – I

Coordination Chemistry: **8h**

IUPAC nomenclature - bonding theories - Review of Werner's theory and Sidgwick's concept of coordination - Valence bond theory - geometries of coordination numbers 4-tetrahedral and square planar and 6-octahedral and its limitations, crystal field theory - splitting of d-orbitals in octahedral, tetrahedral and square-planar complexes - low spin and high spin complexes - factors affecting crystal-field splitting energy. Isomerism in coordination compounds - structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers.

Reference: Concise coordination chemistry by Gopalan and Ramalingam
Unified Chemistry III by Dr. O.P. Agarwal

UNIT-II

1. Spectral and magnetic properties of metal complexes: **4h**

Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility-Gouymethod.

Reference : Concise coordination chemistry by Gopalan and Ramalingam
Concise Inorganic Chemistry by J.D.Lee

2. Stability of metal complexes: **3h**

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

Reference : Concise coordination chemistry by Gopalan and Ramalingam
Concise Inorganic Chemistry by J.D.Lee

ORGANIC CHEMISTRY

UNIT- III

Nitro hydrocarbons: **3h**

Nomenclature and classification-nitro hydrocarbons, structure -Tautomerism of nitroalkanes leading to aci and keto form, Preparation of Nitroalkanes, reactivity - reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Micheal addition.

Reference: Unified Chemistry III by Dr. O.P. Agarwal
A Text Book of Organic Chemistry by Bahl and Arun bahl

UNIT – IV

Nitrogen compounds: **12h**

Amines (Aliphatic and Aromatic): Nomenclature, Classification into 1°, 2°, 3°; Amines and Quarternary ammonium compounds.

Preparative methods – Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's 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) Acylation c) Carbylamine reaction d) Hinsberg separation e) Reaction with Nitrous acid of 1°, 2°, 3° (Aliphatic and aromatic amines).

Reference: Unified Chemistry III by Dr. O.P. Agarwal
A Text Book of Organic Chemistry by Bahl and Arun bahl

PHYSICAL CHEMISTRY

UNIT- V

Thermodynamics **15h**

The first law of thermodynamics-statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule-Thomson effect- coefficient. Calculation of w, for the

expansion of perfect gas under isothermal and adiabatic conditions for reversible processes. Temperature dependence of enthalpy of formation- Kirchoff s equation.

Second law of thermodynamics. Different Statements of the law. Carnot cycle and its efficiency. Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes.

Reference: Text book of physical chemistry by S Glasstone
Advanced physical chemistry by Gurudeep Raj

List of Reference Books

1. Concise coordination chemistry by Gopalan and Ramalingam
2. Coordination Chemistry by Basalo and Johnson
3. Organic Chemistry by G.Mare loudan, Purdue Univ
4. Text book of physical chemistry by S Glasstone
5. Concise Inorganic Chemistry by J.D.Lee
6. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
8. A Text Book of Organic chemistry by I L Finar Vol I
9. Advanced physical chemistry by Gurudeep Raj

Assessment Pattern for Theory Paper - V

(A) Internal Assessment for Theory Paper - V :: 40 M

Internal (mid Test average)	Assignments	Attendance	Seminar	Project	Total
10M	10M	05M	05M	10M	40M

(B) External Assessment for Theory paper - V :: 60 M

SRR & CVR Govt. Degree College (Autonomous), Vijayawada

Paper –V: Inorganic, Organic & Physical Chemistry
45 hrs (3hrs/w)

Weightage to Content

Unit	Name of the Chapter	Essay (08M)	Short Answer (04M)
I	Coordination Compounds	1	2
II	Spectral and Magnetic Properties of Metal Complexes	1	1
	Stability of metal Complexes		1
III	Nitro Hydrocarbons	1	2
IV	Nitrogen Compounds	1	2
V	Thermodynamics	1	2

SRR & CVR Govt. Degree College (Autonomous) Vijayawada
Department of Chemistry
Paper –V: Inorganic, Organic & Physical Chemistry

Semester – V

Time: 3Hrs | Max. Marks: 60

Section-A

Answer any FIVE Questions: **4 x 5 = 20 Marks**

1. Write the IUPAC names of $K_4[Fe(CN)_6]$ & $[Co(NH_3)_6]^{3+}$.
   $K_4[Fe(CN)_6]$ & $[Co(NH_3)_6]^{3+}$ యొక్క IUPAC పేర్లను వ్రాయండి.

2. Calculate the EAN of $K_4[Fe(CN)_6]$ complex.
   $K_4[Fe(CN)_6]$ కాంప్లెక్స్ యొక్క EAN ను లెక్కించండి.

3. Mention different types of Magnetic behavior?
   వివిధ రకాల అయస్కాంత లక్షణాలను పేర్కొనండి?

4. Write note on Chelate Effect.
   చీలేట్ ప్రభావం గురించి వ్రాయండి.

5. Discuss the tautomerism of nitroalkanes.
   నైట్రోఆల్కేన్ యొక్క టాటోమెరిజం గురించి చర్చించండి

6. What is nef reaction?
   నెఫ్ రియాక్షన్ అంటే ఏమిటి?

7. Explain Carbylamine reaction of aromatic amines.
   ఆరోమాటిక్ అమైన్స్ యొక్క కార్బైల్ అమైన్ ప్రతిచర్యను వివరించండి.

8. Give a note on Hoffman's bromamide reaction.
   హాఫ్మన్ యొక్క బ్రోమామైడ్ ప్రతిచర్యను ఇవ్వండి.

9. Write the statements of first and second law of thermodynamics.
   థర్మోడైనమిక్స్ యొక్క మొదటి మరియు రెండవ నియమం యొక్క స్టేట్మెంట్లను వ్రాయండి.

10. Write the Kirchoff's equation. కిర్చాఫ్ యొక్క సమీకరణాన్ని వ్రాయండి.

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Section-B

Answer ALL questions: **5 x 8 = 40 Marks**

11. Write the postulates of Valence bond theory and explain the structure of $K_4[Fe(CN)_6]$ with respect to VBT.

వాలెన్సీ బాండ్ సిద్ధాంతం యొక్క ప్రతిపాదనలు వ్రాసి, VBT కి సంబంధించి $K_4[Fe(CN)_6]$ యొక్క నిర్మాణాన్ని వివరించండి.

or

12. Explain the splitting of d-orbitals in Octahedral and Tetrahedral complexes.

ఆక్టాహెడ్రల్ మరియు టెట్రాహెడ్రల్ కాంప్లెక్స్‌లలో d-ఆర్బిటాల్స్ విభజన గురించి వివరించండి.

13. Explain the Jobs method for determining the composition of coordination complexes.

సమన్వయ సమ్మేళనాల నిర్మాణాన్ని నిర్ణయించడానికి Jobs పద్ధతిని వివరించండి.

or

14. Explain Gouy method.

గౌయ్ పద్ధతిని వివరించండి.

15. Write (a) Nef Reaction; (b) Mannich reaction leading to Micheal addition.

(ఎ) నెఫ్ రియాక్షన్; (బి) మైఖేల్ చేరికకు దారితీసే మన్నిచ్ ప్రతిచర్య లను వ్రాయండి

or

16. Write any two preparative methods of nitroalkanes and their reaction with HONO.

నైట్రోఅల్కనే యొక్క ఏవైనా రెండు తయారుచేయు పద్ధతులను మరియు HONO తో వాటి ప్రతిచర్యను వ్రాయండి.

17. Discuss the classification of amines and compare the basic strength of ammonia with alkyl amines.

అమైన్‌ల వర్గీకరణ గురించి చర్చించండి మరియు అమ్మోనియా యొక్క క్షార స్వభావాన్ని ఆల్కైల్ అమైన్‌ల క్షార స్వభావంతో పోల్చండి.

Or

18. Explain (i) Hinsberg separation (ii) Reaction of aliphatic and aromatic amines with HONO.

హిన్స్బర్గ్ విభజన (ii) HONO తో అలిఫాటిక్ మరియు ఆరోమాటిక్ అమైన్స్ యొక్క ప్రతిచర్య ను వివరించండి.

19. Write a note on Joule-Thomson Effect and its Co-efficient.

జూల్-థామ్సన్ ప్రభావం మరియు దాని సహ-సమర్థతపై ఒక గమనిక రాయండి. OR

20. Explain carnot cycle and its efficiency. / కార్నోట్ చక్రం మరియు దాని సామర్థ్యాన్ని వివరించండి.

SRR & CVR Govt. Degree College (Autonomous) Vijayawada

Department of Chemistry

Paper –V: Inorganic, Organic & Physical Chemistry

Question Bank

Short Answer type Questions: (4M)

1. Write the IUPAC names of $K_4[Fe(CN)_6]$ & $[Co(NH_3)_6]^{3+}$.
2. Calculate the EAN of $K_3[Fe(CN)_6]$ complex
3. Write the Postulates of werner's theory
4. Mention the factors affecting crystal field splitting energy
5. Write a note on Chelate Effect.
6. Mention different types of Magnetic behavior?
7. Write a note on structural Isomerism
8. Write the spin only formula with suitable example
9. Discuss various factors affecting the stability of complexes
10. Explain Nef reaction
11. Write the tautomerism of nitro alkanes
12. Discuss any two methods of preparation of nitroalkanes

13. Write a note of Basic nature of amines

12. Explain the Hinsberg method of separation

13. Give a note on Kirchoff's equation

12. Give the statement of first and second law of thermodynamics

Long Answer Questions (8M)

13. Write the postulates of Valence bond theory and explain the structure of $K_4[Fe(CN)_6]$ with respect to VBT.

14. Explain the splitting of d-orbitals in Octahedral and Tetrahedral complexes.

15. Explain the Jobs method for determining the composition of coordination complexes.

16. Explain Gouy's method.

17. Write (a) Nef Reaction; (b) Mannich reaction leading to Micheal addition.

18. Write any two preparative methods of nitroalkanes and their reaction with HONO.

19. Write a note on Joule-Thomson Effect and its Co-efficient.

20. Explain carnot cycle and its efficiency.

LABORATORY COURSE – V

Practical Paper – V :: Organic Chemistry (at the end of semester V)

30 hrs (2 h / W)

Course outcomes: By the completion of this laboratory course, student is able to

- Analyse the given organic compound by systematic procedure
- Understand the chemical reactions of organic compound by experimental procedure
- Correlate the theoretical and experimental knowledge of organic reactions

Organic Qualitative Analysis: **50M**

Analysis of an organic compound through systematic qualitative procedure for functional group identification including the determination of melting point and boiling point with suitable derivatives.

Alcohols, Phenols, Aldehydes, Ketones, Carboxylic acids, Aromatic Primary Amines, Amides and Simple sugars.

Scheme of valuation: **Practical Paper – V :: Organic Chemistry**

I. Internal practical examination: 25M

S.No.	Scheme	Marks
i.	Record	10 M
ii.	Viva-voce	10M
iii.	Field visit	05M
	Total	25M

II. External practical examination: 25M

Organic Compound analysis

S.No.	Scheme	Marks
1	Physical state, colour and solubility	1M
2	Combustion	1M
3	M.P / B.P	2M
4	Litmus test	1M
5	Element detection	3M
6	Test with $FeCl_3$	2M
7	Test with 2,4 D.N.P	2M
8	Test with $NaHCO_3$	1M
9.	Test with alcoholic KOH+$CHCl_3$	1M
10	Molisch Test	2M
11	Test with NaoH	1M
12	Specific test/ derivative (3M+3M)	6M
13	Report	2M
	Total	25M

SEMESTER-V

Paper - VI (INORGANIC, ORGANIC & PHYSICAL CHEMISTRY)

45 hrs (3 h / w)

INORGANIC CHEMISTRY

UNIT-I

1. Reactivity of metal complexes: **4h**

Labile and inert complexes, ligand substitution reactions - SN^1 and SN^2, Substitution reactions of square planar complexes - Trans effect and applications of trans effect.

2.Bioinorganic chemistry: **4h**

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Cu, Zn and Cl^-.

Reference: 1. Unified Chemistry III by Dr. O.P. Agarwal
2. Concise coordination chemistry by Gopalan and Ramalingam

PHYSICAL CHEMISTRY

UNIT-II

1. Chemical kinetics **8h**

Rate of reaction - Definition of order and molecularity. Derivation of rate constants for first and 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.

2. Photochemistry **5h**

Difference between thermal and photochemical processes. Laws of photochemistry- Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield-Photochemical reaction mechanism- hydrogen- chlorine, hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence.

Reference: 1. Advanced Physical Chemistry by Atkins
2.Textbook of physical chemistry by S Glasstone
3. A Textbook of Physical Chemistry by Puri and Sharma
4. Advanced physical chemistry by Gurudeep Raj

ORGANIC CHEMISTRY

UNIT- III

Heterocyclic Compounds **7h**

Introduction and definition: Simple five membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1,4, - dicarbonyl compounds, Paul-Knorr synthesis.

Properties: Acidic character of pyrrole - Electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan.

Pyridine – Structure - Basicity - Aromaticity – chichibabin reaction

Reference: 1. Unified Chemistry III by Dr. O.P. Agarwal
2. A Textbook of Organic Chemistry by Bahl and Arun bahl

UNIT-IV

Carbohydrates **8h**

Monosaccharides: (+) Glucose (aldo hexose) - Evidence for cyclic structure of glucose (some negative aldehydes tests and mutarotation). Pyranose structure (Haworth formula and chair conformational formula). Osazone formation from glucose and fructose – Definition of anomers with examples.

Interconversion of Monosaccharides:

(i) Aldopentose to Aldohexose: (Arabinose to D- Glucose, D-Mannose) (Kiliani - Fischer method).
(ii) Epimers, Epimerisation - Lobry de bruyn van Ekenstein rearrangement.
(iii) Aldohexose to Aldopentose: (D-Glucose to D- Arabinose) by Ruff degradation.
(iv) Aldohexose to Ketohexose: (+)Glucose to (-)Fructose
(v) Ketohexose to Aldohexose : (Fructose to Glucose)

Reference: 1. Unified Chemistry III by Dr. O.P. Agarwal
2. A Textbook of Organic Chemistry by Bahl and Arun bahl

UNIT- V

Amino acids and proteins **7h**

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.

Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating peptide bond (amide linkage).

Reference: 1. Unified Chemistry III by Dr. O.P. Agarwal
2. A Text Book of Organic Chemistry by Bahl and Arun bahl

List of Reference Books

1. Concise coordination chemistry by Gopalan and Ramalingam
2. Coordination Chemistry by Basalo and Johnson
3. Advanced Physical Chemistry by Atkins
4. Text book of physical chemistry by S Glasstone
5. Instrumentation and Techniques by Chatwal and Anand
6. Essentials of nano chemistry by Pradeep
7. A Textbook of Physical Chemistry by Puri and Sharma
8. Advanced physical chemistry by Gurudeep Raj

LABORATORY COURSE – VI

Practical Paper – VI Physical Chemistry (at the end of semester V)
30 hrs (2 h/W)

50M

1. Determination of rate constant for acid catalyzed ester hydrolysis.

2. Determination of molecular status and partition coefficient of benzoic acid in Benzene and water.

3. Determination of Surface tension of liquid.

4. Determination of Viscosity of liquid.

Scheme of valuation

Practical Paper – VI :: Physical Chemistry

I. Internal practical examination: 25M

S.No.	Content	Marks
1	Record	10 M
2	Viva-voce	10M
3	Field visit	05M
	Total	25M

II. External Practical Examination: 25M

Physical Chemistry

S.No.	Content	Marks
1	Procedure	2M
2	Formula	2M
3	Tables	4M
4	For an error upto 1%	12M
5	For an error between 1% to 2%	10M
6	For an error above 2%	7M
7	Calculation	3M
8	Result	2M
	Total	25M

Semester V
Paper VI (Inorganic, Organic & Physical Chemistry)

Unit -I

1) What are Ligand Substitution reactions? Explain SN^1 and SN^2 reactions with examples.
2) Explain Trans Effect and its applications.
3) Give the biological significance of Na, Mg, Fe, Co ,Ni and Zn.

Short Questions

4) What are Labile and Inert complexes? Give examples.
5) Explain the biological significance of K, Cu, and Cl^-.

Unit -II

1) Derive the rate equation for I order reaction.
2) Give any 4 methods to determine the order of a reaction.
3) Explain with examples the reactions having high and low Quantum yield.
4) Write the Laws of Photochemistry and explain the Quantum Yield of a Photochemical reaction.

Short Questions

5) What are Zero order reactions? Give examples.
6) What is half life of a reaction and derive an expression for calculation of half-time change?
7) Define Order and Molecularity.
8) What is Activation energy and give its significance?
9) Explain Florescence and Phosphorescence.
10) Write a short note on Jablonski diagram.

Unit -III

1) Explain why substitution reactions takes place at 2,5 positions in Furan, Thiophene and Pyrrole.
2) Discuss the acidic character of Pyrrole.
3) Explain a) Aromatic character of Pyridine b) Chichibabin reaction

Short Questions

4) Explain Paul Knorr Synthesis.
5) Write short notes on Diels Alder reaction in Furan
6) Explain basicity of Pyridine.

Unit -IV

1) Explain cyclic structure of Glucose.Give Haworth and Chair conformation formulae.
2) Why Glucose and Fructose form same Osazone? Explain with equations.
3) Explain with equations a) Anomers b) Epimers and c) Epimerisation.

Short Questions

4) Write short notes on Mutarotation in Glucose.
5) Explain Ruff Degradation
6) Explain Kiliani - Fischer method.

Unit -V

1) Write any two methods of preparation and three properties of amino acids.
2) Explain a) Zwitter ion b) Iso electric point
3) What are essential amino acids and give examples. Explain the classification of amino acids into acidic, basic, neutral types with examples.

Short Questions

4) What are Lactums? Explain their formation.
5) Write short notes on Malonic ester synthesis of amino acids.
6) Write short notes on Strecker synthesis of amino acids.

DEPARTMENT OF CHEMISTRY

SKILL DEVELOPMENT COURSES UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-21

SRR & CVR GOVT. DEGREE COLLEGE (A)

(NAAC Reaccredited B+ Grade Institution & District Identified College)

VIJAYAWADA- 520004, Andhra Pradesh, INDIA

Board of Studies on November-2020

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SKILL DEVELOPMENT COURSES UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-21

YEAR	SEMESTER	HOURS PER WEEK	TITLE	MARKS	CREDITS
I	II	2	FOOD ADULTERATION	50	2

SRR & CVR GOVT.DEGREE COLLEGE(A)

(NAAC Reaccredited B+ Grade Institution & District Identified College)

VIJAYAWADA- 520004, Andhra Pradesh, INDIA

Semester- II

Syllabus of

FOOD ADULTERATION

Total 30 hours (02hours/week) **02 Credits & Max Marks: 50**

Learning Outcomes:

After successful completion of the course, students will be able to:

1. Get basic knowledge on various foods and about adulteration.
2. Understand the adulteration of common foods and their adverse impact on health
3. Comprehend certain skills of detecting adulteration of common foods.
4. Extend their knowledge to other kinds of adulteration, detection and remedies.
5. Know the basic laws and procedures regarding food adulteration and consumer protection.

SYLLABUS:

UNIT-I – Common Foods and Adulteration: **7 hours**

Common Foods subjected to Adulteration - Adulteration – Definition – Types; Poisonous substances
Foreign matter, Cheap substitutes, Spoiled parts. Adulteration through Food Additives – Intentional
and incidental. General Impact on Human Health.

UNIT-II –: Adulteration of Common Foods and Methods of Detection: **10 hours**

Means of Adulteration Methods of Detection Adulterants in the following Foods:
Milk, Oil, Grain, Sugar, Spices and condiments, Processed food, Fruits and vegetables. Additives
and Sweetening agents (at least three methods of detection for each food item).

UNIT-III –: Present Laws and Procedures on Adulteration: **8 hours**

Highlights of Food Safety and Standards Act 2006 (FSSA) –Food Safety and Standards Authority of

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Semester- II

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and Sweetening agents (at least three methods of detection for each food item).

UNIT-III –: Present Laws and Procedures on Adulteration: **8 hours**

Highlights of Food Safety and Standards Act 2006 (FSSA) –Food Safety and Standards Authority of

India–Rules and Procedures of Local Authorities. Role of voluntary agencies such as, Agmark, I.S.I.
Quality control laboratories of companies, Private testing laboratories, Quality control laboratories of
consumer co-operatives. Consumer education, Consumer's problems rights and responsibilities, COPRA 2019 - Offenses and Penalties – Procedures to Complain – Compensation to Victims.

Recommended Co-curricular Activities (including Hands on Exercises): (05hours)

1. Collection of information on adulteration of some common foods from local market
2. Demonstration of Adulteration detection methods for a minimum of 5 common foods (one method each)
3. Invited lecture/training by local expert
4. Visit to a related nearby laboratory
5. Assignments, Group discussion, Quiz etc.,

Reference e Books and Websites:

1. A first course in Food Analysis–A.Y.Sathe,New Age International(P)Ltd.,1999
2. Food Safety case studies–Ramesh.V.Bhat,NIN,1992
3. https://old.fssai.gov.in/Portals/0/Pdf/Draft_Manuals/Beverages and confectionary.pdf
4. https://cbseportal.com/project/Download-CBSE-XII-Chemistry-Project-FoodAdulteration#gsc.tab=0 (Downloadable e material on food adulteration)
5. https://www.fssai.gov.in/
6. https://indianlegalsolution.com/laws-on-food-adulteration/
7. https://fssai.gov.in/dart/
8. https://byjus.com/biology/food-adulteration/
9. Wikipedia
10. Vikaspedia

Guidelines to the Paper Setter:

The syllabus of Food adulteration paper of semester-II consists of **Adulteration of Common Foods and Methods of Detection, Present Laws and Procedures on Adulteration** The question paper consists of 2 sections. In which,

Section-A consists of eight short answer questions, out of which **FOUR** questions to be answered and each question carries five marks

Section-B consists of FIVE essay questions, out of which **THREE** questions to be answered and each question carries 10 marks .

The examiner has to choose at least one question from each unit and he/she is requested to set question paper in such a way that the entire syllabus should reflect on the question paper.

FOOD ADULTERATION SEMESTER-II BLUE PRINT				
S.No	**UNIT**	**Name of the unit**	**5 marks**	**10 Marks**
1.	I	Common foods and Adulteration	3	2
2.	II	Adulteration of common foods and methods of detection	2	1
3.	III	Present laws and procedures on Adulteration	3	2

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Vijayawada- 520004, Andhra Pradesh, INDIA

Semester- II

FOOD ADULTERATION

MODEL QUESTION PAPER

Max. Marks: 50 **Time: 1½ hours (90 Minutes)**

SECTION- A (4x5M=20 Marks)

Answer any FOUR questions. Each answer carries 5 marks
(At least 1 question should be given from each Unit)

1. Define food adulteration?
2. Explain the adulteration through Food Additives
3. Name few cheap substitutes used in food adulteration
4. Give examples for food additives and sweetening agents
5. Write a short notes on processed food
6. Explain the procedures to complain about the food adulteration
7. Name the laws that governs the food adulteration
8. Explain the procedure to get compensation to the victims of food adulteration

SECTION B (3x10M = 30 Marks)

Answer any THREE questions. Each answer carries 10 marks
(At least 1 question should be given from each Unit)

9. Write an essay on the common Foods which are subjected to Adulteration and explain the types poisonous substances added for food adulteration
10. Describe the highlights of Food Safety and Standards Act 2006 (FSSAI)
11. Explain the food testing and standardized testing methods and protocols
12. Write in detail about the general Impact of food adulteration on Human Health
13. Write an essay on different types of offenses of food adulteration and the penalties impo

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Bridge Course Syllabus (15 hr)

Dept. of Chemistry

Bridge Course objectives

The curriculum of Chemistry bridge course at initial B.Sc stage aims to

- Fill the gap of knowledge pertaining to the Chemistry at the level of +2 and graduation
- Promote understanding of basic facts and Concepts of chemistry, while retaining the excitement of chemistry.
- Make students capable of studying chemistry
- Develop an interest in students studying chemistry as a discipline
- Develop problem solving skills in students.

Inorganic Chemistry

1. S-Block elements : (Alkali and Alkaline earth metals) 4 hrs

General introduction, General Characteristics of elements, Electronic Configurations, Physical and Chemical properties, uses, Compounds of these metals- Oxides, halides, Hydroxides, Salts of oxo acids (carbonates, nitrates, sulphates), Important compounds of industrial and biological importance.

2.Organic Chemistry 4 hrs

Organic Compounds: Classification, and Nomenclature, Hybridization, Shapes of molecules, Influence of hybridization on bond properties.Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment; Organic acids and bases; their relative strength.

Homolytic and Heterolytic fission with suitable examples. Curly arrow rules, formal charges; Electrophiles and Nucleophiles; Nucleophlicity and basicity; Types, shape and their relative stability of Carbocations, Carbanions, Free radicals and Carbenes.

Physical Chemistry 4 hrs

Atomic number, Mass number, Bohr atomic theory, Quantum mechanical model a of atom, orbitals

and quantum numbers, shapes, energy, energy of orbitals, Aufbau principle, Pauli principle, and Hunds rule of maximum multiplicity, electronic configuration of atoms.

General Chemistry

Periodic table and periodicity in properties: 3 hrs

Modern periodic law, classification of elements into groups and periods, nomenclature of elementssli

with atomic number greater than 100, types of elements s,p,d,f blocks. Trends in periodic properties.