

# **S.V.K.P & Dr. K.S. RAJU ARTS & SCIENCE COLLEGE**

**(Autonomous)**

Recognized by UGC as “College with Potential for Excellence(2016-21)”

Accredited by NAAC with “A” Grade

& ISO Certified Institution (with 3 ISO Certificates)

(Affiliated to ADIKAVI NANNAYA UNIVERSITY-Recognized by Govt. of Andhra Pradesh)

PENUGONDA – 534320. W.G.DIST.,

## **DEPARTMENT OF CHEMISTRY (U.G)**



**B.Sc., Chemistry**

**BOS Meeting – V**

**On 15-11-2023**

**BOARD OF STUDIES**

**2023 – 24**



## S.V.K.P & Dr. K.S.RAJU ARTS & SCIENCE COLLEGE (Autonomous)

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(Affiliated to ADIKAVI NANNAYA UNIVERSITY - Recognized by Govt. of Andhra Pradesh)  
PENUGONDA – 534320. W.G.DIST.A.P. INDIA  
Phone No: 08819-246126 Email Id:svkp\_penugonda@rediffmail.com Website : svkpandksrajucollege.edu.in

### Department of Chemistry B.O.S. Meeting-V

The Meeting of the board of Studies in Chemistry is held will be on 15-11-2023 at 02.30 PM through online tool ZOOM .

#### Members Present:







S.No.	Name	Designation
1	Dr. Ch. Durga Prasad Head, Dept. of Chemistry SVKP & Dr. KS Raju Arts & Science College(A),Penugonda.	Chairman
2	Dr. G. Ramu, Head of the Department of PG Chemistry, Sir C. R. R. College(A),Eluru. 9441159874, ramug1971@gmail.com	University Nominee
3	Dr. M . David Raju, Dept of Chemistry, P. B. Siddhartha college(A)Vijayawada, N T R Dt, AP. 9963036641, mdavidraju40@gmail.com	Subject Expert
4	Sri S. Anil Dev, Dept of chemistry, D.N.R College(A) Bhimavaram, W.G.Dt., A.P. 8179179899, anildevs1974@gmail.com	Subject Expert
5	Sri M.V. Murali Krishna Lecturer in Chemistry SVKP & Dr. KS Raju Arts & Science College(A),Penugonda.	Member
6	Miss. Ch. Rama Lakshmi Lecturer in Chemistry SVKP & Dr. KS Raju Arts & Science College(A),Penugonda	Member
7	Smt. K.Manikyam Lecturer in Chemistry SVKP & Dr. KS Raju Arts & Science College(A),Penugonda	Member
8	Sri D. Suresh Lecturer in Chemistry SVKP & Dr. KS Raju Arts & Science College(A),Penugonda	Member
9	Dr.D. Chandra Sekhar, Assistant Professor. Dept.of Engineering Chemistry, SRKR Engineering College, Bhimavaram, W.G.Dt., A.P. 9290886820, chandul884@gmail.com	Representative from Industry
10	Sri. G. Abhiram Krishna, Jr Lecturer in Chemistry, S.V.K.P& P.V Juniouir College, Penugonda, W.G.Dt., A.P. 7382015846, abhiramkrishna83@gmail.com	Alumni

**Agenda:**

1. To frame the Syllabus, Blue print and Model Question Papers (Theory and Practical) for I and II semesters of first year (w.e.f.2023 - 2024 admitted batch) for the Academic year 2023-24, for External and Internal examinations.
2. To discuss about the ratio of CIA (Continues Internal Assessment) and SEE (Semester End Examinations) from the present ratio 25:75 to 30:70 for the 2023-24 admitted batch onwards.
3. To Coordinate Teaching, Research, Extension and other Academic Activities in the Department.
4. To suggest innovative teaching methods.
5. To submit proposal for conducting Seminars, Workshops etc.
5. To prepare syllabus for certificate/add on programs.
6. To prepare a list of examiners for paper setting.
7. Any other matter.

**Resolution:**

1. Discussed and recommended that no changes are required in the proposed syllabi, Blue Print and Model Question papers for Theory and Practical for both External and Internal Examinations for I and II semester for the admitted batch 2023-24 for the academic year 2023-2024.
2. Discussed and recommended that the ratio of CIA (Continues Internal Assessment) and SEE (Semester End Examinations) from the present ratio 25:75 to 30:70 for the 2023-24 admitted batch onwards.
3. Faculty of the Department are advised to concentrate on Research work and Extension Activities by attending Seminars, Workshops and Guest Lectures etc.
4. Faculty of the Department are advised to use more ICT methods.
5. It is resolved to send proposals to UGC or any other funding agency for National Seminar/Workshops etc.
6. Resolved to approve the syllabus for certificate/add on programs.
7. It is resolved to approve the list of examiners prepared.

S.No.	Name	Designation	Signature
1	Dr. Ch. Durga Prasad Head, Dept. of Chemistry SVKP & Dr. KS Raju Arts & Science College(A), Penugonda.	Chairman	
2	Dr. G. Ramu, Head of the Department of PG Chemistry, Sir C. R. R. College(A), Eluru. 9441159874, ramug1971@gmail.com	University Nominee	
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5	Sri M.V. Murali Krishna Lecturer in Chemistry SVKP & Dr. KS Raju Arts & Science College(A), Penugonda.	Member	
6	Miss. Ch. Rama Lakshmi Lecturer in Chemistry SVKP & Dr. KS Raju Arts & Science College(A), Penugonda	Member	
7	Smt. K. Manikyam Lecturer in Chemistry SVKP & Dr. KS Raju Arts & Science College(A), Penugonda	Member	
8	Sri D. Suresh Lecturer in Chemistry SVKP & Dr. KS Raju Arts & Science College(A), Penugonda	Member	
9	Dr.D. Chandra Sekhar, Assistant Professor. Dept.of Engineering Chemistry, SRKR Engineering College, Bhimavaram, W.G.Dt., A.P. 9290886820, chandul884@gmail.com	Representative from Industry	
10	Sri. G. Abhiram Krishna, Jr Lecturer in Chemistry, S.V.K.P& P.V Junieur College, Penugonda, W.G.Dt., A.P. 7382015846, abhiramkrishna83@gmail.com	Alumni	



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### I B.Sc., I –SEMESTER COURSE-I SYLLABUS W.E.F AY 2023-24 Admitted Batch

### COURSE-I: ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES

PAPER CODE: 23MSC11

Hours: 5hrs/week

Credits: 4

#### Course Objective:

The objective of this course is to provide students with a comprehensive understanding of the essential concepts and applications of mathematical, physical, and chemical sciences. The course aims to develop students' critical thinking, problem-solving, and analytical skills in these areas, enabling them to apply scientific principles to real-world situations.

#### Learning outcomes:

1. Apply critical thinking skills to solve complex problems involving complex numbers, trigonometric ratios, vectors, and statistical measures.
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations
3. To Explain the basic principles and concepts underlying a broad range of fundamental areas of chemistry and to Connect their knowledge of chemistry to daily life.
4. Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
- 5 To explore the history and evolution of the Internet and to gain an understanding of network security concepts, including threats, vulnerabilities, and countermeasures.

## **UNIT I: ESSENTIALS OF MATHEMATICS: 9hrs**

Complex Numbers: Introduction of the new symbol  $i$  – General form of a complex number – Modulus- Amplitude form and conversions

Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation of angles

Vectors: Definition of vector addition – Cartesian form – Scalar and vector product and problems

Statistical Measures: Mean, Median, Mode of a data and problems

## **UNIT II: ESSENTIALS OF PHYSICS: 9hrs**

Definition and Scope of Physics- Measurements and Units - Motion of objects: Newtonian

Mechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance-

Acoustic waves and electromagnetic waves- Electric and Magnetic fields and their interactions-

Behaviour of atomic and nuclear particles- Wave-particle duality, the uncertainty principle-

Theories and understanding of universe

## **UNIT III: ESSENTIALS OF CHEMISTRY: : 9hrs**

Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches of chemistry and significance- Periodic Table- Electronic Configuration, chemical changes, classification of matter, Biomolecules- carbohydrates, proteins, fats and vitamins.

## **UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY: 9hrs**

Applications of Mathematics in Physics & Chemistry: Calculus, Differential Equations & Complex Analysis

Application of Physics in Industry and Technology: Electronics and Semiconductor Industry, Robotics and Automation, Automotive and Aerospace Industries, Quality Control and Instrumentation, Environmental Monitoring and Sustainable Technologies.

Application of Chemistry in Industry and Technology: Chemical Manufacturing, Pharmaceuticals and Drug Discovery, Materials Science, Food and Beverage Industry.

## **UNIT V: ESSENTIALS OF COMPUTER SCIENCE:**

Milestones of computer evolution - Internet, history, Internet Service Providers, Types of Networks, IP, Domain Name Services, applications.

Ethical and social implications: Network and security concepts- Information Assurance Fundamentals, Cryptography-Symmetric and Asymmetric, Malware, Firewalls, Fraud Techniques- Privacy and Data Protection

**Recommended books:**

1. Functions of one complex variable by John.B.Conway, Springer- Verlag.
2. Elementary Trigonometry by H.S.Hall and S.R.Knight
3. Vector Algebra by A.R.Vasishtha, Krishna Prakashan Media(P)Ltd. 4.Basic Statistics by B.L.Agarwal, New age international Publishers
5. University Physics with Modern Physics by Hugh D. Young and Roger A. Freedman
6. Fundamentals of Physics by David Halliday, Robert Resnick, and Jearl Walker
7. Physics for Scientists and Engineers with Modern Physics" by Raymond A. Serway and John W. Jewett Jr.
8. Physics for Technology and Engineering" by John Bird
9. Chemistry in daily life by Kirpal Singh
10. Chemistry of bio molecules by S. P. Bhutan
11. Fundamentals of Computers by V. Raja Raman
12. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson

**APPROVED BY**

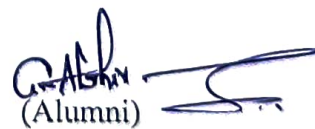
  
(University Nominee)

  
(Subject Expert 1)

  
(Academician)

(Chairman)

  
(Subject Expert 2)

  
(Alumni)



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### STUDENT ACTIVITIES

#### UNIT I: ESSENTIALS OF MATHEMATICS:

##### 1: Complex Number Exploration

Provide students with a set of complex numbers in both rectangular and polar forms.

They will plot the complex numbers on the complex plane and identify their properties 2:

##### Trigonometric Ratios Problem Solving

Give students a set of problems that require the calculation of trigonometric ratios and their relations.

Students will solve the problems using the appropriate trigonometric functions (sine, cosine, tangent, etc.) and trigonometric identities.

##### 3: Vector Operations and Applications

Provide students with a set of vectors in Cartesian form.

Students will perform vector addition and subtraction operations to find the resultant vectors.

They will also calculate the scalar and vector products of given vectors.

##### 4: Statistical Measures and Data Analysis

Give students a dataset containing numerical values.

Students will calculate the mean, median, and mode of the data, as well as other statistical measures if appropriate (e.g., range, standard deviation).

They will interpret the results and analyze the central tendencies and distribution of the data.

#### UNIT II: ESSENTIALS OF PHYSICS:

##### 1. Concept Mapping

Divide students into groups and assign each group one of the topics.

Students will create a concept map illustrating the key concepts, relationships, and applications related to their assigned topic.

Encourage students to use visual elements, arrows, and labels to represent connections and interdependencies between concepts.

##### 2. Laboratory Experiment

Select a laboratory experiment related to one of the topics, such as motion of objects or electric and magnetic fields.

Provide the necessary materials, instructions, and safety guidelines for conducting the experiment.

Students will work in small groups to carry out the experiment, collect data, and analyze the results.

After the experiment, students will write a lab report summarizing their findings, observations, and conclusions.

### **UNIT III: ESSENTIALS OF CHEMISTRY**

#### **1: Chemistry in Daily Life Presentation**

Divide students into groups and assign each group a specific aspect of daily life where chemistry plays a significant role, such as food and nutrition, household products, medicine, or environmental issues.

Students will research and create a presentation (e.g., PowerPoint, poster, or video) that showcases the importance of chemistry in their assigned aspect.

#### **2: Periodic Table Exploration**

Provide students with a copy of the periodic table.

Students will explore the periodic table and its significance in organizing elements based on their properties.

They will identify and analyze trends in atomic structure, such as electronic configuration, atomic size, and ionization energy.

#### **3: Chemical Changes and Classification of Matter**

Provide students with various substances and chemical reactions, such as mixing acids and bases or observing a combustion reaction.

Students will observe and describe the chemical changes that occur, including changes in color, temperature, or the formation of new substances.

#### **4: Biomolecules Investigation**

Assign each student or group a specific biomolecule category, such as carbohydrates, proteins, fats, or vitamins.

Students will research and gather information about their assigned biomolecule category, including its structure, functions, sources, and importance in the human body.

They can create informative posters or presentations to present their findings to the class.

## UNIT IV: APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

### 1: Interdisciplinary Case Studies

Divide students into small groups and provide them with interdisciplinary case studies that involve the interdisciplinary application of mathematics, physics, and chemistry.

Each case study should present a real-world problem or scenario that requires the integration of concepts from all three disciplines.

### 2: Design and Innovation Project

Challenge students to design and develop a practical solution or innovation that integrates mathematics, physics, and chemistry principles.

Students can choose a specific problem or area of interest, such as renewable energy, environmental conservation, or materials science.

### 3: Laboratory Experiments

Assign students laboratory experiments that demonstrate the practical applications of mathematics, physics, and chemistry.

Examples include investigating the relationship between concentration and reaction rate, analyzing the behavior of electrical circuits, or measuring the properties of materials.

### .4: Mathematical Modeling

Present students with real-world problems that require mathematical modeling and analysis.

## UNIT V: ESSENTIALS OF COMPUTER SCIENCE:

1. Identifying the attributes of network (Topology, service provider, IP address and bandwidth of
2. your college network) and prepare a report covering network architecture.
3. Identify the types of malwares and required firewalls to provide security.
4. Latest Fraud techniques used by hackers.

### APPROVED BY

  
(University Nominee)

  
(Subject Expert 1)

  
(Academician)

(Chairman)

  
(Subject Expert 2)

  
(Alumni)



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### The Blue Print for Semester-End Examination (SEE) for 70 Marks

Paper Title: Essentials and Applications of Mathematical, Physical and Chemical Sciences

Paper Code : 23MSC11

Section-A: Multiple Choice Questions (MCQs) 30x1M=30Marks

Section -B: Fill in the Blanks (FIB) 10x1M=10 Marks

Section -C: Very Short Answer Questions (VSQ) 10x1M=10 Marks

Section -D: Matching the items (MC) 2x5M=10 Marks




Section -E: True or False (T/F) 10x1M=10 Marks



QUESTION PAPER TAXONOMY					
Level of Bloom's Taxonomy	Type of Question & Marks Assigned				
	MCQs	FIB	VSQ	MC	T/F
Remembering	10 M				
Understanding	10 M				
Applying	10 M				
Analyzing			10 M		
Evaluating				10 M	10 M
Creating		10 M			
Total	30 M	10 M	10 M	10 M	10 M

#### Unit Wise Breakup:

Unit	Section-A (MCQs)	Section-B (FIB)	Section-C (VSQ)	Section-D (MC)	Section-E (T/F)	Total Marks
Unit I	09	01	03	00	03	16
Unit II	06	01	02	05	01	15
Unit III	06	03	01	05	01	16
Unit IV	03	03	02	00	00	08
Unit V	06	02	02	00	05	15
	30	10	10	10	10	70

APPROVED BY

  
(University Nominee)  
  
(Subject Expert 1)  
  
(Academician)

(Chairman)  
  
(Subject Expert 2)  
  
(Alumni)



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### The Blueprint for Continues Internal Assessment (CIA) for 30 Marks

Paper Title: Essentials and Applications of Mathematical, Physical and Chemical Sciences

Paper Code : 23MSC11

Section-A: Multiple Choice Questions (MCQs) 10x1M=10Marks

Section -B: Fill in the Blanks (FIB) 5x1M=5 Marks

Section -C: Very Short Answer Questions (VSQ) 5x1M=5 Marks

Section -D: Matching the items (MC) 1x5M=5 Marks

Section -E: True or False (T/F) 5x1M=5 Marks

QUESTION PAPER TAXONOMY									
Level of Bloom's Taxonomy	Type of Question & Marks Assigned								
	MCQs	FIB	VSQ	MC	T/F				
Remembering	3 M								
Understanding	3 M								
Applying	4 M								
Analyzing			5 M						
Evaluating					5 M			5 M	
Creating		5 M							

#### Unit Wise Breakup:

Unit	Section-A (MCQs)	Section-B (FIB )	Section-C (VSQ )	Section-D (MC)	Section-E (T/F)	Total Marks
Unit I	03	00	03	00	02	08
Unit II	03	01	01	00	01	06
Unit III	01	01	00	05	00	07
Unit IV	01	02	00	00	00	03
Unit V	02	01	01	00	02	06
	10	05	05	05	05	30

APPROVED BY

(University Nominee)

(Subject Expert 1)

(Academician)

(Chairman)

(Subject Expert 2)

(Alumni)



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**MODEL QUESTION PAPER**

**I B.Sc., I –SEMESTER COURSE-I W.E.F AY 2023-24 Admitted batch**

**Paper Title: Essentials and Applications of Mathematical, Physical and Chemical Sciences**

**Paper Code : 23MSC11**

**SECTION-A**

Multiple Choice Questions (MCQs)

**30x1M=30Marks**

Qs.No:1. TO Qs.No:30

**Section -B:**

Fill in the Blanks (FIB)

**10x1M=10 marks**

Qs.No:31. TO Qs.No:40

**Section -C:**

Very Short Answer Questions (VSQ)

**10x1M=10 marks**

Qs.No:41. TO Qs.No:50

**Section -D:**

Matching the items (MC)

**2x5M=10 marks**

Qs.No:51. And Qs.No:52




**Section -E:**

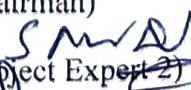

True or False (T/F)

**10x1M=10 marks**

Qs.No:53. TO Qs.No:62

**APPROVED BY**

  
(University Nominee)  
  
(Subject Expert 1)  
  
(Academician)

(Chairman)  
  
(Subject Expert 2)  
  
(Alumni)



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**I B.Sc., I –SEMESTER COURSE-II SYLLABUS W.E.F AY 2023-24 Admitted batch**

**PAPER TITLE: ADVANCES IN MATHEMATICAL, PHYSICAL AND  
CHEMICAL SCIENCES**

**PAPER CODE : 23MSC12**

Hours: 5 hrs/week

Credits: 4

### **Course Objective:**

The objective of this course is to provide students with an in-depth understanding of the recent advances and cutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students' knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines, fostering critical thinking, research skills, and the ability to contribute to scientific advancements.

### **Learning outcomes:**

1. Explore the applications of mathematics in various fields of physics and chemistry, to understand how mathematical concepts are used to model and solve real-world problems.
2. To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations.
3. Understand the different sources of renewable energy and their generation processes and advances in nanomaterials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.
3. Understand the principles and techniques used in computer-aided drug design and drug delivery systems, to understand the fabrication techniques and working principles of nanosensors. Explore the effects of chemical pollutants on ecosystems and human health.
4. Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.
- 5 Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal. Differentiate between analog and digital signals and understand their characteristics. Gain knowledge of different types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radio waves, microwave, satellite)..

**UNIT I: ADVANCES IN BASICS MATHEMATICS** **9hrs**

Straight Lines: Different forms – Reduction of general equation into various forms –Point of intersection of two straight lines

Limits and Differentiation: Standard limits – Derivative of a function –Problems on product rule and quotient rule

Integration: Integration as a reverse process of differentiation – Basic methods of integration

Matrices: Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transpose of a matrix and determinants

**UNIT II: ADVANCES IN PHYSICS:** **9hrs**

Renewable energy: Generation, energy storage, and energy-efficient materials and devices. Recent advances in the field of nanotechnology: Quantum dots, Quantum Communication- recent advances in biophysics- recent advances in medical physics- Shape Memory Materials.

**UNIT III: ADVANCES IN CHEMISTRY:** **9hrs**

Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants on ecosystems and human health, Dye removal - Catalysis method

**UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY**  
**9hrs**

Mathematical Modelling applications in physics and chemistry Application of Renewable energy: Grid Integration and Smart Grids, Application of nanotechnology: Nanomedicine, Application of biophysics: Biophysical Imaging, Biomechanics,

Neurophysics, Application of medical physics: Radiation Therapy, Nuclear medicine Solid waste management, Environmental remediation- Green

Technology, Water treatment.

**UNIT V: Advanced Applications of computer Science** **9hrs**

Number System-Binary, Octal, decimal, and Hexadecimal, Signals-Analog, Digital, Modem, Codec, Multiplexing, Transmission media, error detection and correction- Parity check and CRC, Networking devices- Repeater, hub, bridge, switch, router, gateway.

Recommended books:

1. Coordinate Geometry by S.L.Lony, Arihant Publications
2. Calculus by Thomas and Finny, Pearson Publications
3. Matrices by A.R. Vasishtha and A.K. Vasishtha, Krishna Prakashan Media(P)Ltd.
4. "Renewable Energy: Power for a Sustainable Future" by Godfrey Boyle
5. "Energy Storage: A Nontechnical Guide" by Richard Baxter
6. "Nanotechnology: Principles and Applications" by Sulabha K. Kulkarni and Raghvendra A. Bohara
7. "Biophysics: An Introduction" by Rodney Cotterill
8. "Medical Physics: Imaging" by James G. Webster
9. "Shape Memory Alloys: Properties and Applications" by Dimitris C. Lagoudas
10. Nano materials and applications by M.N.Borah
11. Environmental Chemistry by Anil.K.D.E.
12. Digital Logic Design by Morris Mano
13. Data Communication & Networking by Bahrouz Forouzan.

**APPROVED BY**


  
(University Nominee)

(Chairman)

  
(Subject Expert 1)

  
(Subject Expert 2)

  
(Academician)

  
(Alumni)

## STUDENT ACTIVITIES

### UNIT I: ADVANCES IN BASIC MATHEMATICS

#### 1: Straight Lines Exploration

Provide students with a set of equations representing straight lines in different forms, such as slope-intercept form, point-slope form, or general form.

Students will explore the properties and characteristics of straight lines, including their slopes, intercepts, and point of intersection.

#### 2: Limits and Differentiation Problem Solving

Students will apply the concept of limits to solve various problems using standard limits.

Encourage students to interpret the results and make connections to real-world applications, such as analyzing rates of change or optimizing functions.

#### 3: Integration Exploration

Students will explore the concept of integration as a reverse process of differentiation and apply basic methods of integration, such as the product rule, substitution method, or integration by parts.

Students can discuss the significance of integration in various fields, such as physics and chemistry

#### 4: Matrices Manipulation

Students will perform operations on matrices, including scalar multiplication, matrix multiplication, and matrix transpose.

Students can apply their knowledge of matrices to real-world applications, such as solving systems of equations or representing transformations in geometry.

### UNIT II: ADVANCES IN PHYSICS:

#### 1: Case Studies

Provide students with real-world case studies related to renewable energy, nanotechnology, biophysics, medical physics, or shape memory materials.

Students will analyze the case studies, identify the challenges or problems presented, and propose innovative solutions based on the recent advances in the respective field.

They will consider factors such as energy generation, energy storage, efficiency,

sustainability, materials design, biomedical applications, or technological advancements.

## 2: Experimental Design

Assign students to design and conduct experiments related to one of the topics: renewable energy, nanotechnology, biophysics, medical physics, or shape memory materials.

They will identify a specific research question or problem to investigate and design an experiment accordingly.

Students will collect and analyze data, interpret the results, and draw conclusions based on their findings.

They will discuss the implications of their experimental results in the context of recent advances in the field.

## 3: Group Discussion and Debate

Organize a group discussion or debate session where students will discuss the ethical, social, and environmental implications of the recent advances in renewable energy, nanotechnology, biophysics, medical physics, and shape memory materials.

Assign students specific roles, such as proponent, opponent, or moderator, and provide them with key points and arguments to support their positions.

## UNIT III: ADVANCES IN CHEMISTRY:

### 1. Experimental Design and Simulation

In small groups, students will design experiments or simulations related to the assigned topic.

For example, in the context of computer-aided drug design, students could design a virtual screening experiment to identify potential drug candidates for a specific disease target.

For nano sensors, students could design an experiment to demonstrate the sensitivity and selectivity of nano sensors in detecting specific analytes.

Chemical biology-related activities could involve designing experiments to study enzyme-substrate interactions or molecular interactions in biological systems.

Students will perform their experiments or simulations, collect data, analyze the results, and draw conclusions based on their findings.

### 2. Case Studies and Discussion

Provide students with real-world case studies related to the impact of chemical pollutants on ecosystems and human health.

Students will analyze the case studies, identify the sources and effects of chemical pollutants, and propose mitigation strategies to minimize their impact.

Encourage discussions on the ethical and environmental considerations when dealing with chemical pollutants.

For the dye removal using the catalysis method, students can explore case studies where catalytic processes are used to degrade or remove dyes from wastewater.

Students will discuss the principles of catalysis, the advantages and limitations of the catalysis method, and its applications in environmental remediation.

### 3: Group Project

Assign students to work in groups to develop a project related to one of the topics. The project could involve designing a computer-aided drug delivery system, developing a nano sensor for a specific application, or proposing strategies to mitigate the impact of chemical pollutants on ecosystems.

Students will develop a detailed project plan, conduct experiments or simulations, analyze data, and present their findings and recommendations.

Encourage creativity, critical thinking, and collaboration throughout the project.

## UNIT IV: ADVANCED APPLICATIONS OF MATHEMATICS, PHYSICS & CHEMISTRY

### 1: Mathematical Modelling Experiment

Provide students with a mathematical modelling experiment related to one of the topics. For example, in the context of renewable energy, students can develop a mathematical model to optimize the placement and configuration of solar panels in a solar farm.

Students will work in teams to design and conduct the experiment, collect data, and analyze the results using mathematical models and statistical techniques.

They will discuss the accuracy and limitations of their model, propose improvements, and interpret the implications of their findings in the context of renewable energy or the specific application area.

### 2: Case Studies and Group Discussions

Assign students to analyze case studies related to the applications of mathematical modelling in nanotechnology, biophysics, medical physics, solid waste management, environmental remediation, or water treatment.

Students will discuss the mathematical models and computational methods used in the case studies, analyze the outcomes, and evaluate the effectiveness of the modelling approach.

Encourage group discussions on the challenges, ethical considerations, and potential advancements in the field.

Students will present their findings and engage in critical discussions on the advantages and limitations of mathematical modelling in solving complex problems in these areas.

### 3. Group Project

Assign students to work in groups to develop a group project that integrates mathematical modelling with one of the application areas: renewable energy, nanotechnology, biophysics, medical physics, solid waste management, environmental remediation, or water treatment.

The project could involve developing a mathematical model to optimize the delivery of radiation therapy in medical physics or designing a mathematical model to optimize waste management practices.

Students will plan and execute their project, apply mathematical modelling techniques, analyze the results, and present their findings and recommendations.

Encourage creativity, critical thinking, and collaboration throughout the project.

### UNIT V: Advanced Applications of computer Science

1. Students must be able to convert numbers from other number system to binary number systems
2. Identify the networking media used for your college network
3. Identify all the networking devices used in your college premises.

#### APPROVED BY

  
(University Nominee)

(Chairman)

  
(Subject Expert 1)

  
(Subject Expert 2)

  
(Academician)

  
(Alumni)



## S.V.K.P & Dr. K.S.RAJU ARTS & SCIENCE COLLEGE (Autonomous)

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& ISO Certified Institution (with 3 ISO Certificates)

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PENUGONDA – 534320. W.G.DIST.A.P. INDIA

Phone No: 08819-246126 Email Id:svkp\_penugonda@rediffmail.com Website : svkpandksrajucollege.edu.in

### The Blue Print for Semester-End Examination (SEE) for 70 Marks

Course-II: Advances in Mathematical, Physical and Chemical Sciences

Paper Code : 23MSC12




Section-A: Multiple Choice Questions (MCQs)	30x1M=30Marks
Section -B: Fill in the Blanks (FIB)	10x1M=10 Marks
Section -C: Very Short Answer Questions (VSQ)	10x1M=10 Marks
Section -D: Matching the items (MC)	2x5M=10 Marks
Section -E: True or False (T/F)	10x1M=10 Marks


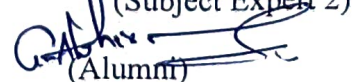
QUESTION PAPER TAXONOMY							
Level of Bloom's Taxonomy	Type of Question & Marks Assigned						
	MCQs	FIB	VSQ	MC	T/F		
	SEE	SEE	SEE	SEE	SEE	SEE	SEE
Remembering	10 M						
Understanding	10 M						
Applying	10 M						
Analyzing			10 M				
Evaluating					10 M		10 M
Creating		10 M					
Total	30 M	10 M	10 M	10 M	10 M		10 M

#### Unit Wise Breakup:

Unit	Section-A (MCQs)	Section-B (FIB)	Section-C (VSQ)	Section-D (MC)	Section-E (T/F)	Total Marks
Unit I	07	02	02	05	00	16
Unit II	05	02	02	00	03	12
Unit III	05	01	02	00	03	11
Unit IV	07	03	02	00	04	16
Unit V	06	02	02	05	00	15
	30	10	10	10	10	70

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(Subject Expert 1)  
  
(Academician)

(Chairman)  
  
(Subject Expert 2)  
  
(Alumni)



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### The Blueprint for Continues Internal Assessment (CIA) for 30 Marks

#### Course-II: Advances in Mathematical, Physical and Chemical Sciences

Paper Code : 23MSC12

Section-A: Multiple Choice Questions (MCQs)	10x1M=10Marks
Section -B: Fill in the Blanks (FIB)	5x1M=5 Marks
Section -C: Very Short Answer Questions (VSQ)	5x1M=5 Marks
Section -D: Matching the items (MC)	1x5M=5 Marks
Section -E: True or False (T/F)	5x1M=5 Marks

QUESTION PAPER TAXONOMY									
Level of Bloom's Taxonomy	Type of Question & m Assigned								
	MCQs		FIB		VSQ		MC		T/F
	CIA		CIA		CIA		CIA		CIA
Remembering	3 m								
Understanding	3 m								
Applying	4 m								
Analyzing					5 m				
Evaluating							5 m		5 m
Creating			5 m						

#### Unit Wise Breakup:

Unit	Section-A (MCQs)	Section-B (FIB)	Section-C (VSQ)	Section-D (MC)	Section-E (T/F)	Total Marks
Unit I	03	00	04	00	01	08
Unit II	01	00	00	05	00	06
Unit III	02	02	00	00	01	05
Unit IV	02	02	00	00	01	05
Unit V	02	01	01	00	02	06
	10	05	05	05	05	30

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(Subject Expert 1)

(Academician)

(Chairman)

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**MODEL QUESTION PAPER**

**I B.Sc., I -SEMESTER COURSE-II W.E.F AY 2023-24 Admitted Batch**

**Course-II: Advances in Mathematical, Physical and Chemical Sciences**

**Paper Code : 23MSC12**

**SECTION-A**

Multiple Choice Questions (MCQs)

**30x1M=30Marks**

**Qs.No:1. TO Qs.No:30**

**Section -B:**

Fill in the Blanks (FIB)

**10x1M=10 marks**

**Qs.No:31. TO Qs.No:40**

**Section -C:**

Very Short Answer Questions (VSQ)

**10x1M=10 marks**

**Qs.No:41. TO Qs.No:50**

**Section -D:**

Matching the items (MC)

**2x5M=10 marks**

**Qs.No:51. And Qs.No:52**

**Section -E:**

True or False (T/F)

**10x1M=10 marks**

**Qs.No:53. TO Qs.No:62**

**APPROVED BY**

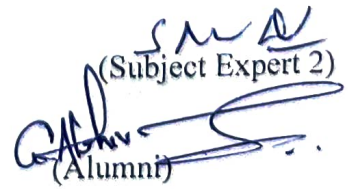
  
(University Nominee)

(Chairman)

  
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### Multidisciplinary Courses Offered for B.A./B.Com./BBA/BCA Majors

w.e.f. AY 2023-24 Admitted Batch

#### SEMESTER-I

### PRINCIPLES OF CHEMICAL SCIENCES

Credits: 2

2 hrs/week

#### I. **Course Outcomes:** At the end of the course the student will be able to-

1. Understand the structure of atom.
2. Identify the isotopes and isobars.
3. Define acids and bases and predict the nature of salts.
4. Explain ionic and covalent bonding.
5. Describe the importance of Chemistry in daily life.

#### II. **Syllabus:**

##### **Unit I: Matter, Atoms, Molecules & Nuclear Chemistry**

Classification of matter, Dalton atomic theory, Thomson Model, Rutherford Model, Bohr's model of atom, quantum numbers, electronic configuration, Aufbau Principle, Pauli's exclusion principle, Hund's rule. Isotopes-Isobars, Nuclear decay, Band of Stability, Nuclear Reaction types, Nuclear Applications.

##### **Unit II: Elements, Classification and Chemical Bonding**

Classification of elements, Periodic Classification of elements based on electronic configuration, classification into types, classification into metals, non-metals and metalloids, periodic properties-atomic radii, ionisation enthalpy, electronegativity, Octet rule, ionic bond properties of Ionic compounds-covalent bond, properties of covalent molecule.

##### **Unit III: Acids, Bases, Salts, Chemistry in Daily life**

Definition, types and properties of Acids, Bases, Salts, strength of acids and bases, pH, Importance of Chemistry in daily life. (food, drugs, textiles, preservatives, soaps and detergents.)




#### III. **List of Reference Books:**

1. Inorganic Chemistry by Puri and Sharma
2. Basic concepts of Inorganic Chemistry by D.N.Singh

#### IV. **Co-curricular activities:**

Projects on Importance of Chemistry in food, drugs, textiles, preservatives, soaps and detergents.

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(University Nominee)  
  
(Subject Expert 1)  
  
(Academician)

(Chairman)  
  
(Subject Expert 2)  
(Alumni) 



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### I B.Sc., II- SEMESTER CHEMISTRY (MAJOR/MINOR)

#### Course Code 3: GENERAL AND INORGANIC CHEMISTRY (23CHE21)

w.e.f 2023-24 Admitted Batch

Theory

Credits: 03

**Course Outcomes:** At the end of the course the student will be able to-

1. Understand the structure of atom and the arrangement of elements in the periodic table.
2. Understand the nature and properties of ionic compounds.
3. Identify the structure of a given inorganic compound.
4. Explain the existence of special types of compounds through weak chemical forces.
5. Define acids and bases and predict the nature of salts.

#### Syllabus:

##### Unit I: Atomic Structure and Periodic table (9 h)

Electronic configuration: Bohr theory, dual nature of electrons, Heisenberg uncertainty principle, the Schrodinger equation, significance of wave functions, normalization of wave function, radial and angular wave functions, Pauli's exclusion principle, Hund's rule, sequence of energy levels (Aufbau principle).

Periodicity: periodic law and arrangement of elements in the periodic table, IUPAC nomenclature and group number, horizontal, vertical, and diagonal relationships in the periodic table. 1.3 General properties of atoms: size of atoms and ions-atomic radii, ionic radii, covalent radii; trend in ionic radii, ionization potential, electron affinity; electronegativity - Pauling, Mulliken-Jaffe, Allred-Rochow definitions; oxidation states and variable valency; isoelectronic relationship; inert-pair effect;

**Additional Inputs** : Planck's radiation law, photoelectric effect.

## UNIT 2: Ionic bond (9 h)

Properties of ionic compounds, factors favouring the formation of ionic compounds-ionization potential, electron affinity, and electronegativity. Lattice energy: definition, factors affecting lattice energy, Born-Haber cycle-enthalpy of formation of ionic compound and stability. Stability of ionic compounds in terms of  $\Delta H_f$  and  $U_0$ . Solubility and thermal stability of ionic compounds. Covalent character in ionic compounds-polarization and Fajan's rules; effects of polarization-solubility, melting points, and thermal stability of typical ionic compounds.

## UNIT 3: The Covalent Bond (9 h)

Valence Bond theory-arrangement of electrons in molecules, hybridization of atomic orbitals and geometry of molecules- $\text{BeCl}_2$ ,  $\text{BF}_3$ ,  $\text{CH}_4$ ,  $\text{PCl}_5$ ,  $\text{SF}_6$ - VSEPR model-effect of bonding and nonbonding electrons on the structure of molecules, effect of electronegativity,

isoelectronic principle, illustration of structures by VSEPR model- $\text{NH}_3$ ,  $\text{H}_2\text{O}$ ,  $\text{SF}_4$ ,  $\text{ICl}_4^-$ ,  $\text{ICl}_2^-$ ,  $\text{XeF}_4$ ,  $\text{XeF}_6$

Molecular orbital theory -LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules ( $\text{N}_2$ ,  $\text{O}_2$ ,  $\text{CO}$  and  $\text{NO}$ )

**Additional Inputs** : Construction of M.O. diagrams of  $\text{HCl}$  and  $\text{HF}$  molecule.

## UNIT 4: Metallic and Weak Bonds (9 h)

The Metallic bond: metallic properties, free electron theory, Valence Bond Theory, band theory of metals. Explanation of conductors, semiconductors and insulators.

Weak bonds: hydrogen bonding-intra- and intermolecular hydrogen bonding, influence on the physical properties of molecules, comparison of hydrogen bond strength and properties of hydrogen bonded N, O and F compounds; associated molecules-ethanol and acetic acid; Vanderwaals forces, ion dipole-dipole interactions.

## UNIT 5: Acids and Bases (9 h)

Theories of acids and bases: Arrhenius theory, Bronsted-Lowry theory, Lewis theory, the solvent system, Nonaqueous solvents: classification-protonic and aprotic solvents, liquid ammonia as solvent-solutions of alkali and alkaline earth metals in ammonia.

Types of chemical reactions: acid-base, oxidation-reduction, calculation of oxidation number.

Definition of pH, pK<sub>a</sub>, pK<sub>b</sub>. Types of salts, Salt hydrolysis. Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.

**Additional Inputs** : Concept of Conjugated acids and bases.

**List of Reference Books:**

1. J. D. Lee, Concise Inorganic Chemistry, 5<sup>th</sup> ed., Blackwell Science, London, 1996.
2. . B. R. Puri, L. R. Sharma, K. C. Kalia, Principles of Inorganic Chemistry, Shoban Lal Nagin Chand and Co., 1996.
3. D. F. Shriver and P. W. Atkins, Inorganic Chemistry, 3<sup>rd</sup> ed., W. H. Freeman and Co, London,

  
(University Nominee)

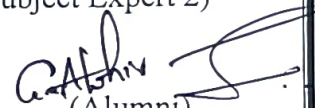
  
(Subject Expert 1)

  
(Academician)

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(Chairman)

  
(Subject Expert 2)

  
(Alumni)



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### II - SEMESTER

Course Code 3: GENERAL AND INORGANIC CHEMISTRY (23CHE21P)

Credits: 01

### PRACTICAL

#### Practical- I Qualitative Analysis of SIMPLE SALT

Qualitative inorganic analysis (Minimum of Six simple salts should be analyzed) 50 M

#### I. Course outcomes:

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

1. Understand the basic concepts of qualitative analysis of inorganic simple salt.
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

#### Laboratory course syllabus: Analysis of SIMPLESALT 50 M

Analysis of simple salt containing ONE anion and ONE cation from the following:

Anions: Carbonate, Sulphate, Chloride, Bromide, Acetate, Nitrate, Borate, Phosphate. Cations: Lead, Copper, Iron, Aluminium, Zinc, Nickel, Manganese, Calcium, Strontium, Barium, Magnesium and Ammonium.

#### Co-curricular activities and Assessment Methods

1. Continuous Evaluation: Monitoring the progress of student's learning.
2. Class Tests, Work sheets and Quizzes
3. Presentations, Projects and Assignments and Group Discussions:  
Enhances critical thinking skills and personality
4. SEMESTER -End Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the SEMESTER

**Reference books:**

1. Vogel's Quantitative Inorganic Analysis, Seventh edition, Pearson.



(University Nominee)



(Subject Expert 1)



(Academician)

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(Chairman)



(Subject Expert 2)



(Alumni)



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### The blueprint for Semester-End examination question paper for Chemistry

#### Course Code 3: GENERAL AND INORGANIC CHEMISTRY (23CHE21)

**Part-1:** Answer any five questions choosing atleast two from each section. Each question carries 10 marks. **5x10M=50 marks**

**Part-2 :** Answer any five questions. Each question carries 4 marks. **5x4M=20 marks**

Unit	Part-1		Part-2	Total Marks
	Section-A	Section-B		
Unit I	2	0	2	28
Unit II	2	0	1	24
Unit III	1	1	1	24
Unit IV	0	2	2	28
Unit V	0	2	2	28
				132

### The blueprint for Internal examination question paper for UG Chemistry

4 questions to be answered out of 6 questions

Each question carries 5 marks


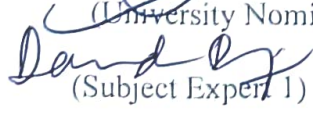

MID Examination I


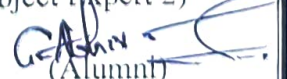
Unit	No. of Questions	No. of Questions to be answered	Co-Curricular Activity	Extra-Curricular Activity	Total Marks
Unit I	2	Any 4 ( 4 X 5 = 20 marks)	5	5	30
Unit II	2				
Unit III	2				

MID Examination II

Unit	No. of Questions	No. of Questions to be answered	Co-Curricular Activity	Extra-Curricular Activity	Total Marks
Unit III	2	Any 4 ( 4 X 5 = 20 marks)	5	5	30
Unit IV	2				
Unit V	2				

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(Subject Expert 1)  
  
(Academician)

(Chairman)  
  
(Subject Expert 2)  
  
(Alumnus)



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**I B.Sc., II- SEMESTER CHEMISTRY (MAJOR/MINOR)**

**Course Code 3: GENERAL AND INORGANIC CHEMISTRY (23CHE21)**

**w.e.f 2023-24 Admitted Batch**

**Theory**

**Credits: 03**

Time : 3 Hrs

Max.Marks:70

**MODEL QUESTION PAPER**

**PART – 1**

**Answer any five questions choosing atleast two from each section. Each question carries 10 marks.**

**5x10=50 marks**

**Section-A**

1. Write Schrodinger wave equation and its significance .
2. What are periodic properties?. Explain how the properties vary in periods and groups.?
3. Define lattice energy. Write the factors affecting on lattice energy.
4. Explain about FAJANS rule.
5. Write about valence bond theory and explain the structure of  $\text{BrF}_3$  and  $\text{PCl}_5$  .

**Section-B**

6. Explain about Molecular orbital theory and construction of M.O diagram of  $\text{N}_2$  molecule.
7. Write about band theory of metals.
8. Explain the concept of free electron theory.
9. Explain the following theoris.
  - a) Bronsted – Lowry theory.
  - b) Arrhenius theory
10. Explain about HSAB principal and its applications.

PART – 2

Answer any five questions. Each question carries 4 marks.

5x4=20 marks

11. Write a short note on Pauli's exclusion principle.
12. Explain the diagonal relationship in the periodic table .
13. Write a short note on ionic compounds .
14. Explain the structure of  $\text{BeCl}_2$  and  $\text{CH}_4$ .
15. Draw the M.O diagram of CO molecule.
16. Define hydrogen bonding ? and explain the types of hydrogen bonding ?
17. Write a short note on Ion dipole - dipole interactions .
18. Explain about acid - base reactions.

\*\*\*\*\*



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### I B.Sc., II- SEMESTER CHEMISTRY (MAJOR/MINOR)

#### Course Code 4: INORGANIC CHEMISTRY (23CHE22)

w.e.f 2023-24 Admitted Batch

#### Theory

Credits: 03

#### 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 concepts of d-block elements
3. Distinguish lanthanides and actinides.
4. Describe the importance of radioactivity.

#### Syllabus:

##### UNIT –I Chemistry of p-block elements – I 9 h

Group 13: Preparation & structure of Diborane, Borazine and (BN)<sub>x</sub>

Group 14: Preparation, classification and uses of silicones and Silanes.

Group 15: Preparation & structure of Phosphonitrilic Chloride P<sub>3</sub>N<sub>3</sub>Cl<sub>6</sub>

Additional Inputs : Preparation and reactions of hydrazine, hydroxylamine.

##### Unit II Chemistry of p-block elements – II 9 h

Group 16: Classification of Oxides, structures of oxides and Oxoacids of Sulphur

Group 17: Preparation and Structures of Interhalogen compounds. Pseudohalogens,

Additional Inputs : Concept of group 18 (Inert gases).

##### UNIT-III Chemistry of d-block elements: 9 h

Characteristics of d-block elements with special reference to electronic configuration, variable valence, colour, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states of 3d series-Latimer diagrams.

#### UNIT-IV Chemistry of f-block elements: 9 h

Chemistry of lanthanides - electronic configuration, oxidation states, lanthanide contraction, consequences of lanthanide contraction, colour, magnetic properties.

Separation of lanthanides by ion exchange method.




Chemistry of actinides - electronic configuration, oxidation states, actinide contraction, comparison of lanthanides and actinides.

#### Unit – V Radioactivity 9 h


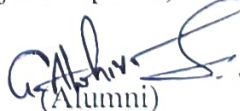
Definition, Isotopes, n/p ratio, binding energy, types of radioactivity, Soddy-Fajan's displacement law, Law of Radioactivity, Radioactive decay series, Nuclear Reactions- fission and fusion, Applications of radioactivity.

#### List of Reference books:

1. Basic Inorganic Chemistry by Cotton and Wilkinson
2. Advance Inorganic chemistry vol-I by Satya Prakash
3. Inorganic chemistry by Puri and Sharma
4. Concise Inorganic Chemistry by J D Lee
5. Nuclear Chemistry by Maheshwar Sharon, 2009

  
(University Nominee)  
  
(Subject Expert 1)  
  
(Academician)

APPROVED BY

(Chairman)  
  
(Subject Expert 2)  
  
(Alumni)

## II -SEMESTER

Course Code 4: INORGANIC CHEMISTRY- I (23CHE22P)

### PRACTICALS

Credits: 01

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#### Course outcomes:

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

1. Understand the basic concepts of inorganic preparations.
2. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
3. Apply the properties of various elements for the preparation of inorganic compounds.

#### Syllabus:

##### Preparation of Inorganic compounds:

4. Crystallization of compounds and determination of melting point.
5. Preparation of Cuprous chloride.
6. Preparation of Potash Alum.
7. Preparation of Chrome Alum.
8. Preparation of Ferrous oxalate
9. Preparation of Ferrous ammonium sulphate.

#### Co-curricular activities and Assessment Methods

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

#### Reference books:

1. Vogel's Quantitative Inorganic Analysis, Seventh edition, Pearson.



## S.V.K.P & Dr. K.S.RAJU ARTS & SCIENCE COLLEGE (Autonomous)

Accredited by NAAC with "A" Grade, Recognized by UGC as "College with Potential for Excellence(2016-21)" & ISO Certified Institution (with 3 ISO Certificates)

(Affiliated to ADIKAVI NANNAYA UNIVERSITY - Recognized by Govt. of Andhra Pradesh)

PENUGONDA – 534320. W.G.DIST.A.P. INDIA

Phone No: 08819-246126 Email Id:svkp\_penugonda@rediffmail.com Website : svkpandksrajucollege.edu.in

### The blueprint for Semester-End examination question paper for Chemistry

#### Course Code 4: INORGANIC CHEMISTRY (23CHE22)

**Part-1:** Answer any five questions choosing atleast two from each section. Each question carries 10 marks. **5x10M=50 marks**

**Part-2 :** Answer any five questions. Each question carries 4 marks. **5x4M=20 marks**

Unit	Part-1		Part-2	Total Marks
	Section-A	Section-B		
Unit I	2	0	2	28
Unit II	2	0	1	24
Unit III	1	1	1	24
Unit IV	0	2	2	28
Unit V	0	2	2	28
				132

### The blueprint for Internal examination question paper for UG Chemistry

4 questions to be answered out of 6 questions

Each question carries 5 marks

MID Examination I

Unit	No.of Questions	No.of Questions to be answered	Co-Curricular Activity	Extra-Curricular Activity	Total Marks
Unit I	2	Any 4 ( 4 X 5 = 20 marks)	5	5	30
Unit II	2				
Unit III	2				

MID Examination II

Unit	No.of Questions	No.of Questions to be answered	Co-Curricular Activity	Extra-Curricular Activity	Total Marks
Unit III	2	Any 4 ( 4 X 5 = 20 marks)	5	5	30
Unit IV	2				
Unit V	2				

APPROVED BY

  
(University Nominee)

  
(Subject Expert 1)

  
(Academician)

(Chairman)

  
(Subject Expert 2)

  
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Course Code 4: INORGANIC CHEMISTRY (23CHE22)

### MODEL QUESTION PAPER

Time :3Hrs

Max.Marks:70

#### PART – 1

Answer any five questions choosing atleast two from each section. Each question carries 10 marks.  
5x10=50 marks

#### Section-A

1. What are Silicones? Give its two preparation methods and its uses.
2. Write the synthesis and structure of Diborane?
3. Explain the classification of oxides based on
  - (i) Oxygen content
  - (ii) Chemical nature.
4. Write the preparation and structure of inter halogen compounds.
5. Explain Electronic Configuration and Catalytic properties of d block elements of 3d series.

#### Section-B

6. Explain stability of various oxidation states of 3d-series –Latimer diagram.
7. Write Electronic Configuration and Oxidation states of 4f-block elements.
8. Explain Separation of Lanthanides by Ion Exchange method.
9. Explain Soddy-Fajan's displacement law & Law of Radioactive decay series.
10. Write Nuclear fission and Nuclear fusion with examples.

**PART – 2**

**Answer any five questions. Each question carries 4 marks.**

**5x4=20 marks**

11. Write the preparation and structure of borazine.
12. Explain about Phosphonitrilic chloride.
13. What are pseudohalogens, write the preparation of pseudohalogens.
14. Explain the magnetic properties of d-block elements.
15. Write about lanthanide contraction.
16. Write comparison between lanthanides & actinides.
17. Define Isotopes. Give any two examples.
18. Explain applications of radioactivity.

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