

**PITHAPUR RAJAH'S GOVERNMENT COLLEGE
(AUTONOMOUS)**

KAKINADA - 533 001, EAST GODAVARI, A.P.

Affiliated to Adikavi Nannaya University

NAAC Accredited with "A" Grade (3.17 CGPA)

BOARD OF STUDIES OF CHEMISTRY

B.Sc. Chemistry Under CBCS

Meeting Minutes/Resolutions



2021-22

Convened on 02 December 2021

DEPARTMENT OF CHEMISTRY

P. R. GOVT. COLLEGE (Autonomous)

Opp. Mc Laurin High School, Raja Ram Mohan Roy Road,
Kakinada

www.prgc.ac.in; e-mail: chemistry_dept@prgc.ac.in

P. R. Govt. College (A), Kakinada

Recommended Composition and Functions of the Board of Studies of Chemistry: 2021-22

I Composition

1. Head of the Department concerned (Chairman):

Dr. D. Rama Rao, M.Sc., B. Ed., M. Phil., Ph.D.

2. The entire faculty of each specialization.

1. Dr. D. Chenna Rao
2. V. Sanjeeva Kumar
3. T. V. V. Satyanarayana
4. P. Vijay Kumar
5. V. Rambabu
6. G. Pavani
7. Dr. T. Uma Maheswara Rao
8. Dr. N. Bujji Babu
9. Dr. Ch. Praveen
10. V. Venkateswara Rao

3. One expert in the subject from outside the college to be nominated by the Academic Council

Sri. V. Mallikarjuna Sarma, Lecturer in Chemistry, ASD Govt. Degree College for Women (Autonomous), Kakinada.

4. One expert to be nominated by the Vice-Chancellor from a panel of six recommended by the College Principal

Dr. K. Jhansi Lakshmi, Lecturer in Chemistry, ASD Govt. Degree College for Women (Autonomous), Kakinada.

5. One representative from industry/ Corporate Sector/ allied area relating to Placement.

Dr. B. Ramesh Babu, Founder & M.D., BogaR laboratories, Peddapuram.
Ph: 9701712028.

6. One postgraduate meritorious alumnus to be nominated by the Principal. The chairman, Board of Studies, may with the approval of the Principal of the College, Co-opt.

K.N.S. Swamy, M.Sc., APSET (Student Alumni Member)

II. Term

The term of the nominated members shall be two years.

III. Meeting

The Principal of the College shall draw the schedule for meeting of the Board of Studies for different Departments. The meeting may be scheduled as and when necessary but at least once in a year.

IV. Functions

The Board of Studies of a Department in the College shall:

- a) Prepare syllabus and various courses keeping in view the objectives of the College interest of the stakeholders and national requirement for consideration and approval of the Academic Council.
- b) Suggest methodologies for innovative teaching and evaluation techniques.
- c) Suggest panel of names to the Academic Council for appointment of examiners.
- d) Coordinate research, Teaching, Extension and other academic activities in the Department/ College.

P.R. GOVT.COLLEGE (A) KAKINADA
DEPARTMENT OF CHEMISTRY

Meeting of Board of Studies in Chemistry is convened on 02 December 2021 through offline at P.R. Govt. College (A), Kakinada, at 3.00 PM.

Venue: Conference Hall, Dt: 02-12-2021, Thursday - 3.00 PM.

The Principal Dr. B.V. Tirupanyam, Chairman, Dr. D. Rama Rao, University Nominee, Dr. K. Jhansi Lakshmi, Lecturer in Chemistry, ASD Govt. Degree College for Women (Autonomous), Kakinada, Industrialist Dr. B. Ramesh Babu, Founder & M.D., BogaR laboratories, Peddapuram, Subject Expert Sri. V. Mallikarjuna Sarma, Lecturer in Chemistry, ASD Govt. Degree College for Women (Autonomous), Kakinada, all the faculty members of Chemistry Department and student alumni attended the meeting.

Agenda:

- To discuss the Semester System and Choice Based Credit System (CBCS) being implemented for the past 06 years, i.e., w.e.f. 2015-16.
- To discuss and approve the Continuation/Modifications of the syllabus for the Odd & Even Semesters of I, II & III Years for 2021-22.
- Grant of Extra credits for Online SWAYAM MOOCs etc.
- Syllabus, Model Question Papers and Model Blue Prints for I, II, III, IV, V and VI Semesters.
- Teaching learning methodology by 60:40 (External: Internal) ratio for the present II- and III-Year Students and 50:50 (External: Internal) ratio I Year Students w.e.f. 2021-22.
- Panel of paper setters and examiners.
- Proposals for Community Service Projects/Extension activities for the benefit of the society.
- Department action plan for 2021-22.
- To discuss and resolve the minor modifications/refinement if any, in the cluster electives CI, CII & CIII as majority of the students opting this cluster as their choice.
- Any Other Proposal with the Permission of the Chairman.

Resolutions:

The Board of Studies meeting was convened by the Chemistry Department on 02.12.2021 at 3.00 pm under the chairmanship of Dr. D. Rama Rao, In-charge of the department. Dr. K. Jhansi Lakshmi, University Nominee., Sri. V. Mallikarjuna Sarma, Lecturer in Chemistry, ASD Degree College for Women's, Kakinada and all members of the faculty of Chemistry and student representatives attended the meeting. The following agenda items are discussed and resolutions are made.

1. It is resolved to continue choice-based credit system in the chemistry combination programmes as per the directions of the CCE, Vijayawada to the first year, second year and final year students for the academic year 2021-22.
2. Resolved to follow 50%-50% external and internal pattern of evaluation w. e. f. 2021-2022 admitted batch and it will be continued in second and third year consecutively.
3. Resolved to follow 60%-40% external and internal for 2018-2019 and 2019-2020 admitted batch and the same is continued in second and third year.
4. It is resolved to allocate 50 marks for project work for final year students of chemistry in cluster paper C - 3 practicals, w.e.f 2021-22 in accordance with APSCHE.
5. It is resolved to conduct Departmental activities such as OZONE DAY, CHEM FEST, CHEMISTRY DAY, SCIENCE DAY etc.
6. It is resolved to offer Subject Electives and clusters A, B and C in the VI Semester as per the guidelines of AKNU
7. It is resolved to implement the recommended pedagogy for the first semester 2021-22
8. Resolved to conduct practical examinations semester wise.
9. It is resolved to organize guest lectures by eminent professors.
10. Resolved to implement no pass minimum for internal assessment for CBSE pattern students as the pattern is learner oriented.
11. It is resolved to maintain status quo for question paper pattern in I, II, III years.
12. It is resolved to encourage students enroll in MOOCS Online Programmes and give extra credits for students after successful completion of the courses.
13. Resolved to submit proposals to conduct a faculty development program in instrumentation techniques/ advanced topics with the assistance of the industry representatives and university representatives.
14. Resolved to assist the orphan children of below two years age being taken by

department of women and child welfare as an extension activity with the funds contributed by the faculty members of the Department.

15. Resolved that the syllabus/ workload distribution to the individual lecturers is either as Paper wise or as Track wise.

Signatures of the members who attended the Board of studies in Chemistry

On 02nd December 2021

Mode of Conduct of meeting: Offline

- | | |
|-------------------------------|--|
| 1. Dr. D. Rama Rao | Chairman & Lecturer in Charge |
| 2. Dr. K. Jhansi Lakshmi, | University
representative
ASD Govt. Degree
College for Women
(Autonomous),
Kakinada.. |
| 3. Dr. B. Ramesh Babu, | Founder & M.D., BogaR laboratories,
Peddapuram. Ph: 9701712028. |
| 4. Sri. V. Mallikarjuna Sarma | Subject expert
Lecturer in
Chemistry,
ASD Degree College for Women's, Kakinada |
| 5. Dr. D. Chenna Rao | Member |
| 6. V. Sanjeeva Kumar | Member |
| 7. T. V. V. Satyanarayana | Member |
| 8. P. Vijay Kumar | Member |
| 9. V. Ram babu | Member |
| 10. G. Pavani | Member |
| 11. Dr. T. Uma Maheswara Rao | Member |
| 12. Dr. N. Bujji Babu | Member |
| 13. Dr. Ch. Praveen | Member |
| 14. V. Venkateswara Rao | Member |
| 15. K.N.S. Swamy | Student Alumni Member |

Signatures of the members who attended the

Board of studies in Chemistry on 02.12.2021 at 3.00pm

Mode of Conduct of meeting: Offline

NAME	SIGNATURE	CONTACT NO.
Dr. D. Rama Rao		
Dr. K. Jhansi Lakshmi	K. Jhansi Lakshmi	9441236409
Dr. B. Ramesh Babu	B. Ramesh Babu	9701712028
Sri. V. Mallikarjuna Sarma	Sri. V. Mallikarjuna Sarma	9676822550
Dr. D. Chenna Rao	Dr. D. Chenna Rao	9560740108
V. Sanjeeva Kumar	V. Sanjeeva Kumar	9849324966
T. V. V. Satyanarayana	T. V. V. Satyanarayana	9490876913
P. Vijay Kumar	P. Vijay Kumar	9652023012
V. Ram babu	V. Ram babu	9948485537
G. Pavani	G. Pavani	9701877823
Dr. T. Uma Maheswara Rao	Dr. T. Uma Maheswara Rao	9247714077
Dr. N. Bujji Babu	Dr. N. Bujji Babu	9441394792
Dr. Ch. Praveen	Dr. Ch. Praveen	9491185518
V. Venkateswara Rao	V. Venkateswara Rao	9885165588
K.N.S. Swamy	K.N.S. Swamy	9908900962

ACTION PLAN BOS MEETING -CHEMISTRY HELD ON 02.12.2021.

1. Department activities for 2021-22 academic year.

Annexure- I

Month	Activity proposed	Faculty member in charge
July-21	Departmental staff meeting to review results and class work allotment	Dr. D. Rama Rao
July - 21	Preparation of curricular plans, time-tables etc.,	All Faculty Members
Aug - 21	Remedial coaching classes for II & III year supplementary exams	All Faculty Members
Sept-21	Ozone day	All Faculty Members
Nov-21	National Education Day - Outreach Program to nearby school	All Faculty Members
	Student awareness programmes on ragging& eve teasing - consequences , self- discipline, career guidance, higher education opportunities etc.,	All Faculty Members
	Bridge classes for I year students	All Faculty Members
Dec-21	World AIDS Day	All Faculty Members
	Chemistry day & Chem fest	All Faculty Members
Jan-21	10 days coaching for PG entrance examinations in chemistry Study tour / Field trips	All Faculty Members
Feb-21	NATIONAL SCIENCE DAY	All Faculty Members
March-21	Consumer awareness day	Dr. D. Rama Rao

**2. Organizing National/ State level seminars/Workshops/ Conferences/ Training programs etc., with topics and other details.
(Mandatory for each Department)**

- i) Faculty Development Program
- ii) Student Training Programme in TLC/Column Chromatography
- iii) Awareness on OZONE protection
- iv) National Chemistry day
- v) National Science day 2021
- vi) Guest Lectures
- vii) National seminar in chemistry
- viii) Training in Soil analysis
- ix) Training in water analysis

3. Change of modules in the syllabus content.

Syllabus changed for first, second and final years as per university regulations and CBCS pattern.

4. Plan for utilization of funds for Autonomous/CPE/other grants available for arranging guest lectures, faculty improvement programs, study tours, equipping laboratories, reference books & other necessary teaching-learning material with ICT enabled teaching.

I. Study visits to:

Rs, 50,000

1. Visakha Steel Plant, Visakhapatnam
2. Hetero Laboratories, Nakkapally
3. Dr. Reddy's Laboratories, Yanam.
4. National Institute of Hydrology, Kakinada.
5. SAR Chandra Environ Solutions, Kakinada.
6. ONGC mini refinery, Tatipaka.
7. Soil analysis laboratory, Samalkot.
8. IICT, HYD
9. Venky parenterals, Yanam

II. Purchase of Equipment

- | | |
|--|-----------|
| 1. Sophisticated version UV-Visible spectrophotometer- | 5.0 lakhs |
| 2. Rotavapour | 4.0 lakhs |
| 3. Other equipment | 1.0 lakhs |

5. Plan for organizing subject oriented community outreach programs & allocation of necessary funds. (Mandatory for each Department)

- | | | |
|--------------------------------|-----|--------|
| i) Adoption of village | Rs. | 20,000 |
| ii) Medical Awareness programs | Rs. | 10,000 |

6. Instituting of new medals/incentives/prizes etc., from alumni, philanthropists, parents, faculty etc., - Strategies to be recommended

7. Introduction of new programs -PG/UG/Diploma and certificate courses.

8. Any other program that enhances the learning capacity of students and their employable & knowledge skills.

Training in the use of instruments like AAS, UV-Vis, HPLC, flame photometer, uranium analyzer, soil and water analysis projects, air quality projects.

9. Proposed panel of examiners/paper setters & other experts/nominees for BOS deliberations.

Chemistry:

1. Sri. V. Mallikarjuna Sarma, Lecturer in Chemistry, ASD Govt. Degree College for Women (Autonomous), Kakinada.
2. Dr. V. Narayana Rao, Lecturer in Chemistry, GDC, Perumallapuram.
3. Dr. T. Narasimha Murthy, Lecturer in Chemistry Govt. Arts College, Rajamahendravaram.
4. Dr. P. Siva Kumar, Lecturer in Chemistry, Govt. Arts College, Rajamahendravaram.
5. Sri. U. Sai Krishna, Lecturer in Chemistry, Govt. Arts College, Rajamahendravaram
6. Sri. K. Anand, Lecturer in Chemistry, GDC, Pithapuram.

Structure of Chemistry Syllabus under CBCS

YEAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS
I	I	I	Inorganic and Physical Chemistry	100 (50:50)	04
			Practical - I	50	01
	II	II	Organic and General Chemistry	100 (50:50)	04
			Practical - II	50	01
II	III	III	Spectroscopy and Physical Chemistry	100 (60:40)	04
			Practical - III	50	01
	IV	IV	Inorganic, Organic and Physical Chemistry	100 (60:40)	04
			Practical - IV	50	01
	IV	V	Inorganic and Physical Chemistry	100 (60:40)	04
			Practical - V	50	01
III	V	V	Inorganic, Organic and Physical Chemistry	100 (60:40)	03
			Practical - V	50	02
		VI	Inorganic, Organic and Physical Chemistry	100 (60:40)	03
			Practical - VI	50	02
	* Any one Paper from VII A,B and C	VII (A)*	Elective	100	03
			Practical - VII A	50	02
		VII (B)*	Elective	100	03
			Practical - VII B	50	02
		VII (C)*	Elective	100	03
			Practical - VII C	50	02
	** Any one cluster from VIII, A, B and C	VIII (A)**	Cluster Electives - I :		
			VIII-A-1	100	03
			VIII-A-2	100	03
			VIII-A-3	50	02
			Practical	50	02
			Practical	50	02
		VIII (B)**	Project		
			Cluster Electives - II ::		
			VIII-B-1	100	03
			VIII-B-2	100	03
			VIII-B-3	100	03
			Practical	50	02
			Practical	50	02
			Project	50	02

VIII (C)**

Cluster Electives - III ::

VIII-C-

100

03

1 VIII-

100

03

C-2

100

03

VIII-C-

50

02

3

50

02

Practical

50

02

Practical

Project

Allotment of Extra credits guidelines

Sl.No.	Activity	Details of achievement	Credits
1	MOOC Course	SWAYAM/NPTEL/CEC etc., (Course Completion certificate with credits should be produced for the claim of extra credits)	Total credits achieved will be considered
2	NCC	B CERTIFICATE	2
		Participation in National Camp after 'B' certificate	3
		C CERTIFICATE	4
		Adventure camp/RD parade along with 'B'	5
		Failed in B certificate Examination	1
3	Sports	Intercollegiate selection	2
		South zone selection	3
		All India participation	4
		Winning medals in all India competitions	5
4	NSS	40% attendance in regular NSS activities	1
		50% attendance with Community Service	2
		Conduct of survey/Youth exchange/RD	3
5	JKC	Enrollment and training	1
		Campus recruitment local level	2
		MNCs/reputed companies	3
6	Community service	Participation in community service by departments (outreach programmes)	2
7	Cultural activity	Winning medals at state level-2, District level-1	2 1
8	COP/Add on Course	Pass in Certificate Exam-1, Diploma-2	1 2
9	Support services	Lead India, Health club, RRC and Eco Club etc., participation in various programmes	1

P. R. GOVERNMENT COLLEGE, KAKINADA
SYLLABUS FOR SEMESTER – I (CHEMISTRY)
Paper I (Inorganic & Physical chemistry) 60 hrs.
(4h/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 courses.

INORGANIC CHEMISTRY 24 h

UNIT –I

Chemistry of p-block elements **8h**

Group 13: Preparation & structure of Diborane, Borazine

Group 14: Preparation, classification and uses of silicones

Group 15: Preparation & structures of Phosphonitrilic halides $\{(\text{PNCl}_2)_n \text{ where } n=3,4\}$

Group 16: Oxoacids of Sulphur (structures only)

Group 17: Pseudo halogens, Structures of Interhalogen compounds.

Additional Input: Oxides of Sulphur (structures only)

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: **4h**

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

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

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 insulators.

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

PHYSICAL CHEMISTRY

36h

UNIT-III

Solid state

10h

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law 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.

Additional Input: Defects in crystals. Stoichiometric and non-stoichiometric defects.

UNIT-IV

1. Gaseous state

6h

van der Waal's equation of state. Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. Relationship between critical constants and vander Waal's constants. Joule-Thomson effect. Inversion temperature.

2. Liquid state

4h

Liquid crystals, mesomorphic state. Differences between liquid crystal and solid/liquid. Classification of liquid crystals into Smectic and Nematic. Application of liquid crystals as LCD devices.

Additional Input: Law of corresponding states.

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), Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.

2. Ionic equilibrium

3h

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

3. Dilute solutions

7h

Colligative properties- RLVP, Osmotic pressure, Elevation in boiling point and depression in freezing point. Experimental method for the determination of molar mass of a non-volatile solute using osmotic pressure, abnormal colligative properties. Van't Hoff factor.

Additional Input: Effect of impurity on consolute temperature. Immiscible liquids and steam distillation. Experimental methods for the determination of Elevation in boiling point and depression in freezing point.

Co-curricular activities and Assessment Methods

1. Continuous Evaluation: Monitoring the progress of students learning
2. Class Tests, Work sheet sand Quizzes
3. Presentations ,Projects and Assignments and Group Discussions:
Enhances criticalthinking skills and personality
4. Semester- end Examination: critical indicator of student's learning
and teachingmethods 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. Mortimer, R. G.PhysicalChemistry3rdEd. Elsevier: NOIDA,UP(2009).
11. Barrow, G.M. Physical Chemistry

P. R. GOVERNMENT COLLEGE, KAKINADA
SYLLABUS FOR SEMESTER – I (CHEMISTRY)
Paper I (Inorganic & Organic Chemistry)
Weightage to content

S. No.	Course Content	Essay Questions (10M)	Short Answer Questions (5M)	Total No. Of Questions from each Unit	Total No. of Marks allotted to each Unit
	Inorganic Chemistry				
1	Unit - I	1	2	3	20
2	Unit - II	2	1	3	25
	Physical Chemistry				
3	Unit - III	1	1	2	15
4	Unit - IV	1	2	3	20
5	Unit -V	1	2	3	20
	TOTAL	6	8	14	100

LABORATORY COURSE –I

30hrs (2 h / w)

Practical-I Analysis of SALT MIXTURE

(At the end of Semester-I)

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

Course outcomes:

At the end of the course, the 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 50 M

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

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

Cations: Lead, Copper, Iron, Aluminium, Zinc, Nickel, Manganese, Calcium, Strontium, Barium, Potassium and Ammonium.

P. R. GOVERNMENT COLLEGE, KAKINADA
MODEL PAPER FOR SEMESTER – I (CHEMISTRY)
Paper I (Inorganic & Organic Chemistry)

Duration: 2hrs.

Max. Marks: 50

PART- A

4 X 5 = 20 Marks

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

1. Question from Unit –I
2. Question from Unit –I
3. Question from Unit –II
4. Question from Unit – III
5. Question from Unit –IV
6. Question from Unit – IV
7. Question from Unit – V
8. Question from Unit – V

PART- B

3 X 10 = 30 Marks

Answer any THREE questions. Each carries TEN marks

9. Question from Unit –I
10. Question from Unit –II
11. Question from Unit –II
12. Question from Unit – III
13. Question from Unit – IV
14. Question from Unit – V

P. R. GOVERNMENT COLLEGE, KAKINADA
SEMESTER-I
CHEMISTRY Course-I: INORGANIC & PHYSICAL CHEMISTRY

Question bank

Unit – I

ESSAY QUESTIONS

1. Explain Classification, Preparations & uses of Silicones
2. Explain Preparation and Structure of Diborane.
3. What are Pseudo halogens? Explain the Structures of AX_3 & AX_5 types of interhalogen compounds.

SHORT ANSWER QUESTIONS

1. Explain the preparation and structure of Borazine
2. Explain the structures of Phosphonitrilic compounds.
3. Write any three structures of sulphur oxy acids.

Unit – II

ESSAY QUESTIONS

1. Explain magnetic and catalytic properties of d-block elements.
2. What is Lanthanide Contraction? Explain the Consequences of Lanthanide Contraction?
3. Explain Band theory of Conductors, Semi-conductors and Insulators.

SHORT ANSWER QUESTIONS

1. Why do d- block elements show variable oxidation states? Explain with examples.
2. Explain free electron theory of metals.
3. Explain Valence bond theory of metals.

Unit – III

ESSAY QUESTIONS

1. Derive Bragg's Law. Explain the determination of structure of a crystal by powder method?
2. Explain symmetry elements in crystals.

SHORT ANSWER QUESTIONS

1. Write a short note on Law of constancy of interfacial angles, law of rationality of indices and the law of symmetry.
2. Write short note on Bravais lattices and crystal systems.
3. Define lattice point, space lattice and unit cell?

Unit – IV

ESSAY QUESTIONS

1. Derive the relationship between Critical constants & Van der Waal's constants
2. Why do real gases deviate from ideal gas behavior? Derive Vander Waal's equation of state?
3. State and explain Joule- Thomson effect.

SHORT ANSWER QUESTIONS

1. What are liquid Crystals? Explain.
2. Explain applications of liquid crystals as LCD devices?
3. What is Inversion Temperature? Give Examples.

Unit – V

ESSAY QUESTIONS

1. What is Osmotic Pressure? Determine the molar weight of a non-volatile solute using osmotic pressure?
2. What is Critical Solution temperature? Explain Critical solution temperature for Phenol – water system.

SHORT ANSWER QUESTIONS

1. State and write the applications of Nernst distribution Law?
2. Define colligative properties. Write different types of colligative properties.
3. Explain briefly Common ion effect & Solubility product?