

P. R. GOVERNMENT COLLEGE (A) KAKINADA
(Affiliated to Adikavi Nannaya University)

DEPARTMENT OF CHEMISTRY

B. Sc Chemistry Syllabus under CBCS

BOARD OF STUDIES

2019-20

P.R.Govt. College (A), Kakinada
Recommended Composition of the Board of Studies of Chemistry
And it's Functions of an Autonomous College
April-2019-20

I Composition

1. Head of the Department concerned (Chairman):

Sri T. Vara Prasad, M.Sc., M.Phil, M.Ed (Ph.D)

2. The entire faculty of each specialization.

1. Sri D.Rama Rao, M.Sc., B. Ed., M.Phil.
2. Sri V.Mallikarjuna Sarma, MSc, M.Phil, NET
3. Dr.V.Narayana Rao M.Sc, NET, Ph.D
4. Sri U.Sai Krishna M.Sc, NET

3. ONE experts in the subject from outside the college to be nominated by the Academic Council

1. Dr. K . Jhansi Lakshmi, Lecturer in Chemistry, Ideal Degree College, Kakinada

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

1. Dr. K. Deepti, Adikavi Nannaya University, Rajahmundry

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

1. Ch. V. N. S. Vara Prasad, Managing partner, DAS Pharma Ltd, Kakinada

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.

1. Dr.K.Raghavachari M.Sc., M.Phil, Ph.D.

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

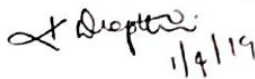
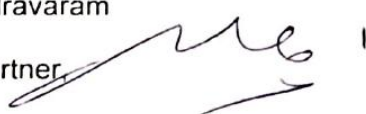
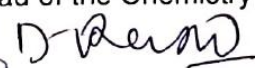
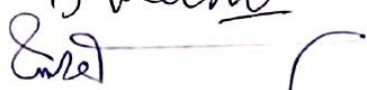
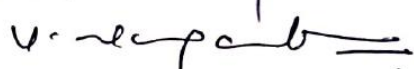
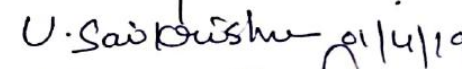
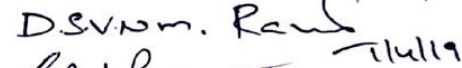
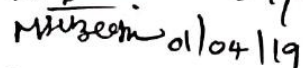
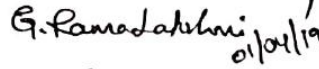
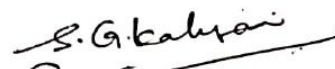
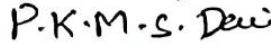
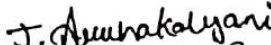
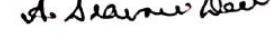
The Board of Studies of a Department in the College shall:

- 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.

Signatures of the members who attended the
Board of studies in Chemistry on 01.04.2019 at 10.00am

- | | |
|------------------------------|--|
| 1. Sri T. Vara Prasad | Chairman & Lecturer in Charge |
| 2. Dr. K. Deepti, | University representative
Adikavi Nannaya University
Rajamahendravaram |
| 3. Ch. V. N. S. Vara Prasad, | Managing partner,
DAS Pharma Ltd, Kakinada |
| 4. Dr. K. Jhansi Lakshmi | Subject expert
Lecturer in Chemistry,
Ideal Degree College, Kakinada |
| 5. . Dr.K.Raghavachari | Retired Head of the Chemistry Department |
| 6. Sri D. Rama Rao | Member |
| 7. Sri V. Mallikarjuna Sarma | Member |
| 8. Dr.V.Narayana Rao | Member |
| 9. Sri U.Sai Krishna | Member |
| 10. Dr.D.S.V.N.M.Rama Murthy | Member |
| 11. Sri K.Babu Rao | Member |
| 12. Smt.S.Swarna Latha | Member |
| 13. Miss. M.S.T.B.V.Ratnam | Member |
| 14. Miss.G.Rama Lakshmi. | Member |
| 15. Mr.B.V.Siva Kumar | Member |
| 16. Miss.S.G.Kalyani | Member |
| 17. G.Sandhya | Member |
| 18. P.K.M.S.Devi | Member |

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11. Sri K.Babu Rao	Member	
12. Smt.S.Swarna Latha	Member	
13. Miss. M.S.T.B.V.Ratnam	Member	
14. Miss.G.Rama Lakshmi.	Member	
15. Mr.B.V.Siva Kumar	Member	
16. Miss.S.G.Kalyani	Member	
17. G.Sandhya	Member	
18. P.K.M.S.Devi	Member	
19. J.Aruna Kalyani (MPC EM)	Student Member	
20. Sankar Rao (MPC EM)	Student Member	
21. A.Sravani Devi (MBC)	Student Member	

ACTION PLAN BOS MEETING -CHEMISTRY HELD ON 01 -04-2019.

1. Department activities for 2019-2020 academic year. Annexure I

Month	Activity proposed	Faculty member in charge
June-19	Departmental staff meeting to review results and class work allotment	T. Vara Prasad
	Preparation of curricular plans, time-tables etc.,	
	Remedial coaching classes for II & III year supplementary exams	
	Bridge classes for I year students	
July-19	Student awareness programmes on ragging& eve teasing - consequences , self-discipline, career guidance, higher education opportunities etc.,	T.Vara prasad
August-19	Conference on prospects in pharmaceutical industries	T. Vara Prasad
	Study tour / Field trips	
Sept-19	Ozone day	
Oct-19	MOLE Day	D.Ramarao
	Faculty development programme	V.Mallikarjuna sarma
Nov-19	11th National Education Day – Out reach Programme to nearby school	
Dec-19	World AIDS Day	
	Chemistry day & Chem fest	V.Mallikarjuna sarma
Jan-20	10 days coaching for PG entrance examinations in chemistry Study tour / Field trips	V.Mallikarjuna sarma
Feb-20	NATIONAL SCIENCE DAY	V.Mallikarjuna sarma
March-20	Consumer awareness day	T. Vara Prasad

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

- i) Staff development programme

- ii) Training in the use of HPLC
- iii) Awareness on OZONE protection
- iv) National Chemistry day
- v) Chem. fest
- vi) National Science day 2019
- vii) Guest lectures
- viii) National seminar in chemistry
- ix) Training in Soil analysis
- x) Training in water analysis

3. Change of modules in the syllabus content.

Syllabus changed for first and second years as per university regulations. CBCS introduced for final year w.e.f. 2018-19.

4. Plan for utilization of funds for Autonomous/CPE/other grants available for arranging guest lectures, faculty improvement programmes, 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.

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

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

- | | |
|----------------------------------|------------|
| i) Adoption of village | Rs. 20,000 |
| ii) Medical Awareness programmes | 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 programmes –PG/UG/Diploma and certificate courses.

New courses to be proposed.

S.No.	New course proposed	Justification	Employability
1	Under graduate course in Industrial chemistry	There is dearth of skilled persons to operate various instruments like uv visible spectrophotometer, Atomic absorption spectrophotometer, PH meter, flame photometer, rotavapour instrument, HPLC.GLC, distillation, etc which play as key role in any industry related to chemistry.	Technical assistants, Quality control managers, Plant supervisors etc.

8. Any other programme 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. Change in internal assessment exams for conducting II mid Semester by way of Project work/Assignment.

Not possible as the number of students is more. However it is proposed to give 33.3% weightage for competitive exam questions pertaining to the syllabus prescribed.

10. proposed panel of examiners/paper setters & other experts/nominees for BOS deliberations.**Chemistry:**

1. Sri N. Lakshmana Rao, SKBR College, Amalapuram.
2. Dr. D. Madhava Sarma, GDC, Tadepalligudem
3. Dr. V. Sambasiva Rao, Govt. Arts College, Rajahmundry.
4. Dr. K. A.R.S.S. Prasad, VS Krishna College, Visakhapatnam.
5. Sri S.V. Ramana, Arts College, Rajahmundry
6. Sri Machi Raju, Arts College, Rajahmundry
7. Smt. C. Jyoti, St. Theresa college, Eluru.
8. P. Krishna kumar, S.K.B.R. College, Amalapuram.
9. Dr. G. Venkatarao, GDC, Vijayavada
10. Shri B. Venkatarao, GDC, Tadepalligudem
11. Dr. Ramchadarao, Y.N. College, Narasapuram

P.R.GOV.T.COLLEGE (A),KAKINADA

DEPARTMENT OF CHEMISTRY,

Minutes of board of studies(BOS) meeting 2019-20 on 01-04-2019 at 10.30am

Resolutions:

The board of studies meeting chemistry department on 01-04-19 at 10.30 am in the guest room of the college under the chairmanship of Dr. T.Vara Prasad ,in charge of the department The principal Dr. Chappidi Krishna, Dr.K.Deepthi, University Nominee., Dr.K.Jhansi Lakshimi, Head in Chemistry, Ideal College, Kakinada., all members of the faculty of chemistry and student representatives attended the meeting. 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, Hyderabad to the first year and second year and second year and final year students w.e.f. 2017-2018.
2. Resolved to follow 60%-40% external and internal w.e.f. 2017-2018 admitted batch and it continued in second and third year.
3. It is resolved to allot 50 marks project work for final year students in chemistry preferably in cluster paper C₃ practicals.w.e.f 2019-20 accordance with APSCHE.
4. in the first year admitted batch w.e.f 2019-20 multiple choice questions and question bank prepared in the first year students only.
 - i) Mid examination –I follows online
 - ii)Mid examination –II follows offline
5. It is resolved to conduct departmental activities such as OZONE DAY, CHEM. FEST , CHEMISTRY DAY and SCIENCE DAY.
6. It Is Resolved to offer Subject Electives and clusters in the V and VI Semester Respectively as per the guidelines of AKNU we adopted the following syllabus
Elective paper -1
Cluster VIII C papers - 3 (C₁, C₂, C₃)
7. It is resolved to implement the recommended pedagogy for the first semester 2018-2019
8. Resolved to conduct practical examinations semester wise.
9. It is resolved to organize guest lectures by eminent professors.
10. Resolved to implement pass minimum for internal assessment for CBSE pattern students as the pattern is learner oriented.
11. It is resolved syllabus change for I , II, III elective, clusters as per the AKNU lines.
12. CBCS introduced for final years w.e.f. 2016-2017.
13. Introduced cluster system for final year w.e.f 2017-2018.
14. cluster theory paper C₃ introduced w.e.f 2019-20 in the place of project 150 marks.
15. project 50 marks in the place of cluster theory paper practicals w.e.f 2019-20

16. followed ratio 60:40 and it continued in third year.

17.it is resolved that B.Voc Pharmaceutical Chemistry course is restructured in B.Sc professional (Pharmaceutical chemistry) w.e.f 201-20. The proposal is put followed to academic council and general body meeting.

18. It is advised to allocate only 50 marks for project in VI semester(cluster VIII-C₃)

19.It is resolved to maintain status quo for same question paper pattern in I, II, III years.

The Following Paper Setter Are Recommended.

- 1). Dr. V. Sambasiva Rao, Govt,Arts College, Rajahmundry.
- 2). Dr.K.A.R.S.S. Prasad, VS Krishna College,Visakhapatnam.
- 3). Sri S.V. Ramana, Arts College, Rajahmundry.
- 4). Sri Machi Raju, Arts College, Rajahmundry.
- 5). Sri U. Satyanarayana , GDC, Tuni.
- 6). Sri R. Brahmaji, GDC, Ramachandrapuram.
- 7). Sri N.V. Sudhakar, GDC, Tuni.

New Courses

20. It is resolved to explore the possibility of introducing a new course in bsc analytical chemistry ,maths,chemistry as per the Govt./CCE order w.e.f 2018-2019.

21. Resolved to submit proposals to conduct a faculty development programme in instrumentation techniques/ advanced topics with the assistance of the industry representatives and university representatives.

22. 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.

23.resolved to change the syllabus components in semester I to Semester II and vice versa. Sly semester III to IV and vice versa on par with the affiliating university.

24. it is proposed to give 33.3% weightage competitive exam questions pertaining to the syllabus prescribed

25. Resolved to reduce the intake of Bsc MPC TM students from 60 to 30 w.e.f from 2019-20.

26. Resolved to increase the intake of Bsc MPC EM students from 30 to 60 w.e.f. from 2019-20.

27. Resolved to take girls students also for admissions into Bsc MCPc w.e.f. from 2019-20.

Special Features of Chemistry Department

1. In the cluster system 85 students opted chemistry projects and they submitted projects to our college under the guidance of eminent lecturers.

2.NAAC team visited our college chemistry department on 08-09-2017 and chairman commented “**chemistry department is very good**” in always.

3. CCB academic team visited our chemistry department on 21-03-2018 and team head was commented as “ **chemistry department is excellent**” always.

Modern Lecture Methods & New Techniques

4. Power Point Presentation / LCD Teaching.

5. Virtual Class Teaching Methods.

6. Feedback on Teaching Performance.

P.R.GOVERNMENT COLLEGE(A), KAKINADA
B.Sc. Chemistry Syllabus under CBCS

Structure of Chemistry Syllabus Under CBCS

YEAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS
I	I	I	Inorganic and Organic Chemistry	100	03
			Practical – I	50	02
	II	II	Physical and General Chemistry	100	03
			Practical – II	50	02
II	III	III	Inorganic and organic Chemistry	100	03
			Practical – III	50	02
	IV	IV	Spectroscopy and Physical Chemistry	100	03
			Practical – IV	50	02
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
	* 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	100	03
			Practica I	50	02
			Practica I	50	02
		VIII (B)**	Cluster Electives - II ::		
			VIII-B-1	100	03
			VIII- B-2	100	03
			VIII-B-3	100	03
			Practica I	50	02
			Practica I	50	02
		VIII (C)**	Cluster Electives - III ::		
			VIII-C-1	100	03
			VIII-C-2	100	03
			VIII-C-3	100	03
			Practica I	50	02
			Practica I	50	02

OBJECTIVES

□ Objectives

The students can obtain the knowledge in the following topics and come to know how chemistry is essential in daily life.

1. Preparation, properties and applications of some special compounds of s and p block elements.
2. Structural theory of Organic compounds.
3. Preparation, properties and applications of alkenes, alkynes and cycloalkanes.
4. Benzene structure and its reactivity.
5. Identification of some cations and anions in the unknown salt.

□ By the end of II semester, each and every I degree chemistry student can obtain the knowledge in the following topics and come to know how chemistry is essential in daily life.

1. Features involved in gaseous state, liquid state and solid state and their applications.
2. Importance of colloids and adsorption.
3. Chemical bonding between molecules through M.O. theory.
4. Identification of some cations and anions in the unknown mixture.
5. Basic knowledge and Importance of Stereochemistry.

□ By the end of III semester, each and every II degree chemistry student can attain the knowledge in the following topics and come to know their role in serving the society through chemistry.

1. Properties of d and f block elements.
2. Bonding nature of the metals.
3. Preparation, properties and applications of halogen compounds, hydroxyl compounds, carbonyl Compounds and carboxylic acids.
4. Importance and synthetic applications of active methylene compounds.
5. Estimation of Fe (II) and Cu (II) in the unknown material through practical.
6. Reactions of some functional groups like phenols, carboxylic acids, aldehydes, ketones, amines and Amides.

- ☐ **By the end of IV semester, each and every II degree chemistry student can attain the knowledge in the following topics and come to know their role in serving the society through chemistry.**

1. Different types of Electronic transitions present in Organic molecules..
2. Identification of Functional groups using IR spectrum.
3. Analysis of Cr and Mn using spectrophotometer.
4. Structural identifications of organic compounds using H^1 -NMR
5. Different aspects of electrochemistry.
6. Identification of functional group present in the given organic compound by IR spectral analysis.
7. Importance of conductometric techniques by doing strength of acids and bases.

- ☐ **By the end of V semester, each and every III degree chemistry student can obtain the knowledge in the following topics and come to know how to serve the society by becoming a chemist.**

1. Involved theories and properties of coordination compounds.
2. Preparation and properties of nitrogen compounds.
3. Importance, preparations, properties and medicinal uses of heterocyclic compounds.
4. Structural elucidation of glucose and fructose.
5. Importance of Amino acids and Proteins.
5. Determination of Rate of the reactions through chemical kinetics.
6. Some photochemical reactions photophysical processes.
7. Importance of thermodynamical aspects.
8. Identification of functional group present in the given organic compound by following organic qualitative analysis.
9. Determination of surface tension and viscosity of some liquids.

- ☐ **By the end of VI semester, each and every III degree chemistry student can get the knowledge in the following topics depending on their choice/interest and come to know how to serve the society by becoming a chemist.**

1. Various types of instrumental techniques like IR and NMR spectroscopies.
2. Different aspects of Environmental Chemistry.
3. Importance of green chemistry.
4. Analyses of drugs, dairy products
6. Importance of petrochemicals.
7. Preparation of some organic compounds.
8. Synthesis of organic compounds using green synthesis.

9. Hands on experience in operating colorimeters, pH meters and potentiometers.
10. Submission of a project work.

OUT COMES

After completion of B.Sc. course the students will be able to:

1. Acquire comprehensive knowledge in physical inorganic and organic chemistry.
2. Acquire experimental skills in chemical analysis.
3. Apply their knowledge and understanding in new situations.
4. Have industrial exposure by visiting near by industry plants.
5. Achieve good ranks in PG entrance examinations.
6. Acquire employable skills and become industry ready persons.
7. Get motivation for research by carrying out projects.
8. Gain leadership quality by participation in extension programmes and group projects etc.

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

OBJECTIVES:

1. Gains knowledge of importance of p-block elements & synthetic applications of organo metallic compounds
2. Understands the role of reagents and reaction mechanism, basics of stereochemistry of organic compounds

INORGANIC CHEMISTRY

30 hrs (2h / w)

UNIT –I

p-block elements –I

15h

Group-13: Synthesis and structure of diborane and higher boranes (B_4H_{10} and B_5H_9), boron-nitrogen compounds ($B_3N_3H_6$ and BN)

Group - 14: Preparation and applications of silanes and silicones. Group - 15: Preparation and reactions of hydrazine, hydroxylamine.

UNIT-II

1. p-block elements -II

8h

Group - 16: Classifications of oxides based on (i) Chemical behaviour and (ii) Oxygen content.

Group-17: Inter halogen compounds and pseudo halogens.

2. Organometallic Chemistry

7h

Definition - classification of Organometallic compounds - nomenclature, preparation, properties and applications of alkyls of Li and Mg.

ORGANIC CHEMISTRY

30hrs (2h /w)

UNIT-III

Structural theory in Organic Chemistry

10 h

Types of bond fission and organic reagents (Electrophilic, Nucleophilic, and free radical reagents including neutral molecules like H_2O , NH_3 & $AlCl_3$).

Bond polarization : Factors influencing the polarization of covalent bonds, electronegativity - inductive effect. Application of inductive effect (a) Basicity of amines (b) Acidity of carboxylic acids (c) Stability of carbonium ions. Resonance or Mesomeric effect, application to (a) acidity of phenol, and (b) acidity of carboxylic acids. Hyper conjugation and its application to stability of carbonium ions, Free radicals and alkenes, carbanions,

carbenes and nitrenes.

Types of Organic reactions : Addition - electrophilic, nucleophilic and free radical.

Substitution - electrophilic, nucleophilic and free radical. Elimination- Examples

UNIT-IV

1. Acyclic Hydrocarbons

6 h

Alkenes - Preparation of alkenes. Properties: Addition of hydrogen - heat of hydrogenation and stability of alkenes. Addition of halogen and its mechanism. Addition of HX, Markonikov's rule, addition of H₂O, HOX, H₂SO₄ with mechanism and addition of HBr in the presence of peroxide (anti - Markonikov's addition). Dienes - Types of dienes, reactions of conjugated dienes - 1,2 and 1,4 addition of HBr to 1,3 - butadiene and Diel's - Alder reaction.

Alkynes - Preparation by dehydrohalogenation of dihalides, dehalogenation of tetrahalides, Properties; Acidity of acetylenic hydrogen (formation of Metal acetylides). Preparation of higher acetylenes, Metal ammonia reductions, Physical properties. Chemical reactivity - electrophilic addition of X₂, HX, H₂O (Tautomerism), Oxidation with KMnO₄, OsO₄, reduction and Polymerisation reaction of acetylene.

2. Alicyclic hydrocarbons (Cycloalkanes)

4 h

Nomenclature, Preparation by Freunds method, Wislicenus method. Properties - reactivity of cyclopropane and cyclobutane by comparing with alkanes, Stability of cycloalkanes - Baeyer's strain theory, Sachse and Mohr predictions and Pitzer's strain theory. Conformational structures of cyclobutane, cyclopentane, cyclohexane.

UNIT-V

Benzene and its reactivity

10h

Concept of resonance, resonance energy. Heat of hydrogenation, heat of combustion of Benzene, mention of C-C bond lengths and orbital picture of Benzene. Concept of aromaticity - aromaticity (definition), Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation)

Reactions - General mechanism of electrophilic substitution, mechanism of nitration, Friedel Craft's alkylation and acylation. Orientation of aromatic substitution - Definition of ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO₂ 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)

List of Reference Books

1. Inorganic Chemistry by J.E.Huheey
2. Basic Inorganic Chemistry by Cotton and Wilkinson
3. A textbook of qualitative inorganic analysis by A.I. Vogel
4. Organic Chemistry by Morrison and Boyd
5. A Text Book of Organic chemistry by I L Finar Vol I
6. Concise Inorganic Chemistry by J.D.Lee

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	3	2	5	40
	Organic Chemistry				
3	Unit - III	1	1	2	15
4	Unit - IV	2	2	4	30
5	Unit -V	1	1	2	15
	TOTAL	8	8	16	120

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

Practical-I Simple Salt Analysis
 (At the end of Semester-I)

Qualitative inorganic analysis

Analysis of simple salt containing one anion and cation from the following

Anions: Carbonate, sulphate, chloride, bromide, acetate, nitrate,
cations: Lead, copper, iron, aluminum, zinc, manganese, nickel, calcium, strontium, barium, potassium and ammonium

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

Duration: 2hrs. 30Min.

Max. Marks: 60

SECTION – A (Inorganic Chemistry)

Answer any **TWO** questions. Each question carries **10** marks. 2 X 10 = 20M

1. Write the preparation and two chemical properties of hydrazine and hydroxyl amine.
2. Explain the classification of Oxides based on chemical behavior and oxygen content.
3. What are inter halogen compounds? How they are classified? Explain the structure of AX_3 , AX_5 , and AX_7
4. What are Grignard Reagents? discuss their preparation and synthetic applications.

SECTION – B (GENERAL CHEMISTRY)

Answer any **TWO** questions. Each question carries **10** marks. 2 X 10 = 20M

5. Explain the different types of organic reactions
6. Explain the addition of HX to Alkenes with reference to Markonikov's and AntiMarkonikov's rule.
7. Write any two methods of preparation and three reactions of Cyclo Alkanes.
8. Explain the mechanism of Nitration and Friedal-Crafts Alkylation of Benzene..

SECTION – C

Answer any **FOUR** questions. Each question carries **5** marks. 4X 5 = 20M

9. Explain the preparation and structure of Borazine
10. Explain one method of preparation and two reactions of Silicones.
11. Explain Pseudo halogens
12. What are organo metallic compounds? Give examples. explain the classification of organo metallic compounds
13. Explain Hyper Conjugation effect?
14. Explain Diels-Alder reaction.
15. Write about the acidic nature of Acetylene. How 2-Butyne is prepared from Acetylene
16. Write Huckel's rule. Apply it to the non-benzenoid compounds.

P. R. GOVERNMENT COLLEGE, KAKINADA
Paper I (Inorganic & Organic Chemistry)

Question bank

Essay questions

UNIT-I

1. Write three preparations and four properties of diborane.
2. Write three preparations and four applications of silanes.
3. Write preparation methods of hydrazine and three properties of it.
4. Write three preparations and four properties of hydroxylamine.
5. Explain the structure of diborane

UNIT-II

1. Explain the classification of oxides based on chemical behavior and oxygen content.
2. Write any three preparation methods of inter halogen compounds.
3. Write the preparation and applications of alkyls of lithium.
4. Write preparations and applications of alkyls of magnesium.

UNIT-III

1. Define Inductive Effect. Write Two Applications Of Inductive Effect.
2. Explain Mesomeric Effect With Two Applications.
3. Explain Hyper conjugation With Two Applications.
4. Explain types of organic reactions.

UNIT-IV

1. Write any four preparations and four properties of alkenes.
2. Write any four preparations and four properties of alkynes.
3. Explain classification of alkadiene. write addition reaction of HBr to 1,3-butadiene.
4. Write any two preparation methods and properties of cyclo alkanes.
5. Explain Baeyer strain theory with limitations.
6. Explain Pitzer strain theory.

UNIT-V

1. Define Huckel's rule. Apply it to benzenoid and non-benzenoid compounds with one example each.
2. Briefly explain the following electrophilic substitution reactions in benzene. A) nitration b) Friedel-Craft's alkylation and acylation.
3. Explain ring activating and deactivating groups.

SHORT ANSWER QUESTIONS

UNIT-I

1. Write the structure of boron nitride.
2. Write structure of B_4H_{10} and B_5H_9
3. Write the Applications of silicones.

UNIT-II

1. Write about pseudo halogens.
2. Explain structure of AX_3 type Inter halogen compounds with one example.
3. Write the classification of organo metallic compounds.

UNIT-III

1. Write about types of bond fission with examples.
2. Explain the following a) Electrophilic b) Nucleophilic c) free radical. Reagents with examples.
3. Explain the stability of carbenes basing on hyper conjugation.

UNIT-IV

1. Explain the addition of hydrogen halide to unsymmetrical alkenes.
2. Explain about diel's-alder reaction .with example.
3. Write about conformations of cyclo butane
4. Write about conformations of cyclo hexane.

UNIT-V

1. Define aromaticity and anti aromaticity.
2. Explain resonance structure of benzene.
3. Explain the orientation of benzene by using nitro group.