PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS)
KAKINADA - 533 001, AP.

Affiliated to Adikavi Nannaya University

NAAC Accredited with "A" Grade (3.17 CGPA)

BOARD OF STUDIES OF CHEMISTRY

B.Sc. CHEMISTRY MAJORS & B.Sc. CHEMISTRY UNDER CBCS

Meeting Minutes/Resolutions

ORGANIC (HONS)

Convened on 30 April 2024

AY 2024-25

DEPARTMENT OF CHEMISTRY

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS)

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

www.prgc.edu.in; e-mail: chemistry@prgc.edu.in

PROCEEDINGS OF THE PRINCIPAL, P.R. GOVERNMENT COLLEGE (A)KAKINADA- A.P

Present: Dr. B. V. Tirupanyam, M. Sc; Ph.D.

R.C.No.2/A.C./BOS/2024-25, Dated: 23.04.2024

SUB: P.R. Government College (A), Kakinada-UG Board of Studies (BOS)- B.Sc-Chemistry-Nomination of Members-Orders issued.

REF: 1. UGC Guidelines for Autonomous Colleges-2018.

ORDERS:

The Principal, P.R. Government College (A), Kakinada is pleased to constitute UG Boards of Studies in CHEMISTRY for framing the syllabi in respective Subject for all Semesters duly following the norms of the UGC Autonomous guidelines.

S. No	Name of the Person	Designation
1	V. Sanjeeva Kumar	Chairman & Lecturer In charge
2	Dr. K. Jhansi Lakshmi ASD Govt. Degree College for Women (Autonomous) Kakinada	University Nominee
3	Dr. D. Chenna Rao Lecturer in Chemistry, Govt. Degree College, Yeleswaram	Subject Expert -I
4	U. Sai Krishna Lecturer in Chemistry, Govt. College, (Autonomous) Rajamahendravaram	Subject Expert - II
5	Dr.N.Ratnakar, AARKISH PHARMACEUTICALS INS NJ,NEW JERSEY	Subject Expert - III
6	Dr. P. KARUNA RAMAN MD, IDEAL ORGANICS HYDERABAD.	Representative from Industry
7	T. V. V. Satyanarayana	Member
8	P. Vijay Kumar	Member
9	V. Ram babu	Member
10	G. Pavani	Member
11	Dr. N. Bujji Babu	Member
12	Dr. Ch. Praveen	Member
13	V. Venkateswara Rao	Member
14	U.S.N. Prasad	Member
15	K.N.S. Swamy	Member
16	S. Vijaya Lakshmi	Member
17	D.Bhavyasri	Member
18	V Ramya	Student Alumni Member
19	Deepthi Anusha II FBC	Student Member
20	BVNagendra Kumar, II MCCS	Student Member
21	J.Veera Durga I CHEMISTRY MAJORS	Student Member

The above members are requested to attend the BoS meeting on 30-04-2024 and share their valuable reviews, and suggestions on the following functionaries.

- Prepare syllabi for the subject keeping in view the objectives of the college, the interest of the stakeholders
- and National requirements for consideration and approval of the IQAC and Academic Council.
- Suggest the panel of Names to the academic council for appointment of Examiners.
- Suggested methodologies for innovative teaching and evaluation techniques.
- Coordinate research, teaching, extension and other activities in the Department of the college.

PRINCIPAL
P. R. Government College(A),
Kakinada

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (A)

DEPARTMENT OF CHEMISTRY

Meeting of Board of Studies in Chemistry is convened on 30 April 2024 through offline/ online at P.R. Govt. College (A), Kakinada, at 10.00 AM.

Venue: JKC AC HALLS , Dt: 30-04-2024, Tuesday – 10.00 A.M.

The Principal Dr. B.V. Tirupanyam; Chairman V. Sanjeeva Kumar; University Nominee Dr. K. Jhansi Lakshmi, Lecturer in Chemistry, ASD Govt. Degree College for Women (Autonomous), Kakinada; Dr. P. KARUNA RAMAN MD, IDEAL ORGANICS HYDERABAD. Industrialist; Subject Experts Dr. D. Chenna Rao, Lecturer in Chemistry, Govt. Degree College, Yeleswaram and U. Sai Krishna Lecturer in Chemistry, Govt. College, (Autonomous), Rajamahendravaram all the faculty members of the Chemistry Department and student alumni attended the meeting.

Agenda:

1. To discuss the I,II,III, IV semesters of a Single major system as B.Sc. Chemistry (Hons), B.Sc. Organic Chemistry (Hons), B.Sc. Analytical Chemistry (Hons) from the academic year 2024-25. & V ,VI semesters of CBCS System
2. To discuss 4th year B.Sc. Honours to the students who were admitted in the academic year 2021-22.
3. To discuss the Semester System and revised Choice Based Credit System (CBCS) being implemented for the past 04 years, i.e., w.e.f. 2020-21.
4. To discuss and approve the Continuation/Modifications of the syllabus for the Odd& Even Semesters of I, II, III & IV Years for 2024-25.
5. Grant of Extra credits for Online SWAYAM MOOCs, edX, Coursera etc.
6. Syllabus, Model Question Papers and Model Blue Prints, POs, PSOs & COs mapping for I, II, III, IV, V, VII and VIII Semesters.
7. Teaching-learning methodology by 50:50 (External: Internal) ratio I, II, III & IV Year Students commenced w.e.f. 2021-22.
8. Minimum attendance of 75% for both I mid-term examination, and II mid- term examination under CIA component shall be the benchmark for attendance and it shall be approved in the BOS.

9. Minimum of 60% integration of ICT into transaction of curriculum.
10. Remedial coaching for slow learners and project works, research, Conferences, etc., for advanced learners.
11. Panel of paper setters and examiners.
12. Implementation of compulsory Community Service Project (CSP)/ Internships/ Apprenticeship and Extension activities for the benefit of the society.
13. Department action plan for 2024-25.
14. To discuss and resolve the minor modifications/refinement if any, in the I, II, III, IV, V, VII, & VIII Semester.
15. Any Other Proposal with the permission of the Chairman.

Signature of the members who attended the board of studies in Organic Chemistry on 30th April 2024 at 10 a.m. mode of conduct of meeting offline / online

SL.NO	NAME	SIGNATURE	CONTACT NO.
1	V. Sanjeeva Kumar	V. S.	9849324966
2	Dr. K. Jhansi Lakshmi	K. Jhansi L.	9441256409
3	Dr. P. KARUNA RAMAN MD, IDEAL ORGANICS, HYDERABAD.	Dr P Karuna Raman	9398249493
4	Dr. D. Chenna Rao		9560740108
5	U. Sai Krishna	U. Sai Krishna	9347334707
6	T. V. V. Satyanarayana	T. V. V. Satya	9490876913
7	P. Vijay Kumar	P. Vijay	9652023082
8	V. Ram babu		9948485537
9	G. Pavani		9912526493
10	Dr. N. Bujji Babu		9441394792
11	Dr. Ch. Praveen	Praveen	9491185518
12	V. Venkateswara Rao	V. Venkateswara	9885165588
13	U.S.N. Prasad	USN Prasad	6300885584
14	K.N.S. Swamy	K.N.S. Swamy	9908900962
15	S. Vijaya Lakshmi	S. Vijaya Lakshmi	9133941966
16	D.Bhavyasri	D. Bhavya	
17	Ch. Veni	Ch Veni	
18	Deepthi Anusha II FBC	P. Deepthi Anusha	7382468859
19	Syamala, II MCCS	A. Syamala	6300192780
20			

ADDITIONS/DELETIONS IN COURSES

CHEMISTRY 2024-25

Year	SEMESTER & PAPER	ADDITIONS	DELETIONS
I	I & I	Adopted the same from APSCHE	
I	I & II	Adopted the same from APSCHE	
I	II & III	Adopted the same from APSCHE	
I	II & IV	Adopted the same from APSCHE	
II	III & III	Adopted the same from APSCHE	
II	IV & IV	Adopted the same from APSCHE	
II	IV & V	Adopted the same from APSCHE	
III	V & VIA	Retrosynthesis of Aspirin , Barton reaction, $NaBH_4$(Mechanism), m CPBA	Retrosynthesis of cyclohexene , DDQ
III	V & VIIA	Fragmentation patterns in Butane and Pentanamine, Types of Solvent extraction- Continuous and Counter current extraction techniques	Application of batch extraction in the separation of organic compounds from mixture- acid & neutral, base & amp; neutral. Coumarin
III	VI	APPERENTICESHIP	
IV HONOURS	VII & VIIIA/B	Adopted the same from APSCHE	
IV HONOURS	VII & IXA/B	Adopted the same from APSCHE	
IV HONOURS	VII & XA/B	Adopted the same from APSCHE	
IV HONOURS	VII & XIA/B	Adopted the same from APSCHE	
IV HONOURS	VII & XIIA/B	Adopted the same from APSCHE	
IV HONOURS	XIII	ONLINE COURSE	
IV HONOURS	VIII & XIV A/B	Adopted the same from APSCHE	

IV HONOURS	VIII & XV A/B	Adopted the same from APSCHE
IV HONOURS	VIII & XVIA/B	Adopted the same from APSCHE
IV HONOURS	VIII & XVIIA/B	Adopted the same from APSCHE
IV HONOURS	VIII & XVIIIA/B	Adopted the same from APSCHE
IV HONOURS	XIX	ONLINE COURSE

CIA structure for Single Major system

- Out of 50 marks for CIA, 25 marks are allocated for Mid examinations. In each semester two mid-examinations will be conducted and the average of the two is considered.
- I mid-examination is to be conducted in offline mode at the college level and II mid-examination is to be conducted in online mode at the department level.
- I mid examination to be conducted in offline mode in which the student should attempt **one essay** question for ten marks out of two questions, **two short** answer questions with five marks each out of four questions and five objective questions with one mark each for each paper.
- Question paper is to be given as per the following structure for the courses with **4 units**

Unit No	Long Answer Question(10M)	Short Answer Question (5 M)	Objective Questions(1M)
I	1	0	1
II	1	0	1
III	0	2	1
IV	0	2	1+ one question from any unit with more syllabus weightage

- For I mid examination to be conducted in offline mode, Question paper is to be given as per the following structure for the courses with **5 units**

S.No	Unit No	Long Answer Question(10M)	Short Answer Question (5 M)	ObjectiveQuestions (1M)
1	I	1	0	1
2	II	1	0	1
3	III	0	1	1
4	IV	0	1	1
5	V	0	1+ one question from any unit(III or IV or V) with more syllabus weightage	1

- The remaining 25 marks for CIA are allocated as per the followingstructure.

Study Project- 10M	Viva on theory- 3M	Assignment- 5M	Seminar- 5M	Clean & green and Attendance- 2M

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*

	PITHAPUR RAJAH'S GOVERNMENT COLLEGE(A) KAKINADA DEPARTMENT OF CHEMISTY	Program & Semester			
Course Code CHE-3	TITLEOFTHECOURSE **COURSE 3: INORGANIC CHEMISTRY**	I B.Sc. **Organic Chemistry** (II Semester)			
Teaching	HoursAllocated:45 (**Theory**)	L	T	P	C
Pre-requisites	Fundamentals of classification of Elements.	45	10	30	3+1

CourseOutcomes:

On Completion of the course, the students will be able to	
CO1	Understand the structures of Diborane ,interhalogen compounds and Daily life applications of silicones.
CO2	Identify the Charecteristics of d – block elements particularly variable oxidation states,Magnetic properties and catalytic Properties.
CO3	Understand how to separate the Lanthanoid complexes.
CO4	Define n/p ratio and Binding energy and predict the types of Radioactive series.

Course with focus on Skill Development/Employability/Entrepreneurship modules

SkillDevelopment		Employability		Entrepreneurship	

Syllabus:

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

Group 13: Preparation & structure of Diborane, Borazine and $(BN)_x$ Group14: Preparation, classification and uses of silicones and Silanes. Group 15: Preparation & structures 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,

UNIT-III Organo metallic Chemistry **9 h**

Definition - classification of Organo metallic compounds - nomenclature, Preparation, Properties and applications of alkyls of Li and Mg.

UNIT-IV 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 – V 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.

Textbooks:

S.NO	AUTHOR	TITLE	PUBLISHER
1	J D Lee	Concise Inorganic Chemistry	
2	Puri and Sharma	Inorganic chemistry	

Reference books

S.NO	AUTHOR	TITLE	PUBLISHER
1	Cotton and Wilkinson	Basic Inorganic Chemistry	
2	Satya Prakash	Advance Inorganic chemistry vol-I	
3	Maheshwar Sharon	Nuclear Chemistry	

WebLinks:

1. https://www.slideshare.net/terencepereira58/diborane
2. https://www.youtube.com/watch?v=xKzaHJAEPeA
3. https://www.idc-online.com/technical_references/pdfs/chemical_engineering/Oxides.pdf
4. https://www.youtube.com/watch?v=4aoUwJ5COpg
5. https://byjus.com/jee/lanthanides/
6. https://www.youtube.com/watch?v=PNQVovRfIoA
7. https://web.pdx.edu/~pmoeck/lectures/modern/TRM-13.ppt
8. https://www.toppr.com/ask/en-np/question/state-soddyfajans-displacement-laws-for-radioactive-transformations/

Course outcome & Program outcome mapping

On Completion of the course, the students will be able to	
CO1	Understand the structures of Diborane ,interhalogen compounds and Daily life applications of silicones.
CO2	Understand the classification, preparation, properties and applications of alkyls of Li and Mg
CO3	Identify the Charecteristics of d – block elements particularly variable oxidation states,Magnetic properties and catalytic Properties.
CO4	Understand how to separate the Lanthanoid complexes.

CO-PO Mapping: **1: Low =1 ;2: Moderate = 2 ; 3: High = 3 ; 4: No Correlation = 0**

CO	PO1	PO 2	PO3	PO 4	PO 5	PO6	PO 7	PSO1	PSO2	PSO 3		
CO1	3	2	2	2	1	2	1	3	2	2		
CO2	3	1	2	2	1	1	1	3	1	2		
CO3	3	2	2	3	2	2	2	3	2	2		
CO4	3	1	1	1	1	1	1	2	1	1		

PROGRAMME OUTCOMES

At the completion of the B.Sc. Chemistry program, the students of our Department will be able to:

(PO1) Knowledge: Attain in depth knowledge about the fundamental principles, essential facts, conclusions and applications of chemical and scientific theories in various domains of chemistry.

(PO2) Critical Thinking: Carry out experiments in the area of organic analysis, estimation, derivative process, inorganic semi micro analysis, preparation, Kinetic, conductometric and potentiometric experiments and spectral analysis applying the domain of critical thinking.

(PO3) Problem Solving: Define the background of reaction mechanisms, complex chemical structures, instrumental method of chemical analysis, and separation techniques and apply appropriate techniques for analyzing specific problems both qualitatively and quantitatively in laboratories and in industries.

(PO4): Usage of modern tools: Create data using modem chemical tools and ICT for modeling and analyze the data obtained from sophisticated instruments (like UV-Vis, FTIR, NMR, GCMS, Fluorescence, SEM, TEM and XRD) for chemical analysis

(PO5): Communication: Develop Skills to evaluate, analyze and interpret the chemical information and data and to communicate effectively within the chemical community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

(PO6): Life-long Learning: Demonstrate scholarly attitude to pursue a career in the field of chemical education and research and have the zeal and vision to engage in independent and life-long learning in the broadest context of technological and social change.

(PO7) Ethical Practices and Social Responsibility: Generate ideas and solutions for green and sustainable chemistry and approach towards planning and execution of research in frontier areas of chemical sciences.

PROGRAM SPECIFIC OUTCOMES (PSO's)

At the time of graduation, our under graduates would be able to:
PSO 1- Evaluate, analyze, interpret and effectively apply the basic laws, principles, phenomena,
processes and mechanisms involved in the domain of organic, inorganic, physical and analytical Chemistry
PSO2 - Demonstrate the knowledge of Chemistry in the domain of research, education and perspective entrepreneurship.

PSO3 - Evaluate distinct problems in the field of chemical data analysis, scientific interpretation
and reaction mechanisms with an understanding on basic tools to be employed.

Weightage to contentSemester -II
Course - 4

S.No	CourseContent	Long Answer	ShortAnswer	Total marks	As per Blooms Taxonomy
1	Chemistry of p – block elements.	1	2	20	Understanding, Application
2	Chemistry of p – block elements.	2	1	25	Remembering, Understanding
3	Organometallic Chemistry.	1	1	15	Analysizing & Creation
4	Chemistry of d- block elements.	1	1	15	Evaluation, Understanding
5.	Chemistry of f-block elements.	1	2	20	Understanding, Application
	TOTAL	**6**	**7**	**95**	

P.R. GOVERNMENT COLLEGE (A), KAKINADA

I YEAR B.Sc (Examination at the end of II semester)
(COURSE – 4 Inrganic Chemistry)
MODEL PAPER

Duration: 2hr **Max.Marks:50M**

Section – 1

Answer any three of the following questions. Must attempt atleast one question from each part. Each question carries 10 Marks. **3 X 10M = 30M**

Part –A

1. Explain any two preparation methods of diborane and deduce its structure. [BT1, CO1]
2. what are oxides of sulfur and explain their classification based on oxygen content and nature [BT2, CO1]
3. Define interhalogen compounds and draw the structure of ClF3 and BrF5. [BT2, CO1]

Part – B

4. Elaborate the characteristics of d- block elements with reference to Magnetic properties and Variable oxidation states [BT3 CO2]

5. How to distinguish the oxidation states of lanthanides and actinides. [BT4 CO3]

6. Define organometallic compounds and explain the classification [BT1, CO4]

Section – II

Answer any four of the following questions. Each carries 5 marks. **4 X 5M= 20M**

7. Why Borazine is called inorganic Benzene. Support your answer with proof? [BT3, CO1]
8. Write the Daily life applications of silicones? [BT2, CO1]
9. Explain the structure and hybridization of SO3. [BT1, CO1]
10. Why Particularly d- block elements act as catalysts. Explain with suitable examples? [BT4, CO2]
11. Brief Lanthanide contraction and write its consequences? [BT3, CO3]
12. Define f-block elements,and explain magnetic properties of lanthanides? [BT1, CO4]
13. Write any two applications of organomagneisum compound? [BT2, CO4]

SEMESTER-II
COURSE 3: INORGANIC CHEMISTRY

Practical Credits: 1 2 hrs/week

Practical-II-Mixture Salt Analysis

(At the end of Semester-I)

Qualitative inorganic analysis

Analysis of Mixture salt containing Two anions and Two cations from the following

Anions: Carbonate, sulphate, chloride, bromide, acetate, nitrate, borate, phosphate.

cations: Lead, copper, iron, aluminum, zinc, manganese, nickel, calcium, strontium, barium, potassium and ammonium.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE(A) KAKINADA

QUESTION BANK FOR SEMESTER-2

B.Sc.(ORGANIC CHEMISTRY) HONORS

UNIT-1 CHEMISTRY OF P-BLOCK ELEMENTS

Essay Questions

1. Discuss the preparation, and structure of Diborane
2. Write the structure of borazole. How it is prepared. Compare borazole properties with those of benzene
3. What are Silicones. How are they classified. Write their preparation and applications

Short answer questions

1. How is Hydrazine prepared. Discuss its properties
2. Write about preparation and properties of Hydroxyl amine
3. Discuss the structure and synthesis of Boron nitride
4. Discuss about preparation and applications of silanes

UNIT-II CHEMISTRY OF P-BLOCK ELEMENTS

Essay Questions

1. Explain the classification and structures of Inter halogen compounds
2. Explain the structures of oxy acids of sulphur
3. Write about the structures of oxides of sulphur
4. Write about the chemical behaviour of sulphur oxides (SO_2 and SO_3)

Short answer questions

1. Write a note on Pseudo halogens
2. Write the structures of ClF_3, IF_5 and IF_7
3.

UNIT-III ORGANONOMETALLIC COMPOUNDS

Essay Questions

1. Define organometallic compounds and explain the classification
2. Write about the preparation, properties and applications of alkyl lithium
3. Write about the preparation, properties and applications of alkyl magneisium

Short answer questions

1. What are the rules involved in the nomenclature of organometallic compounds

UNIT-IV CHEMISTRY OF d-BLOCK ELEMENTS

Essay Questions

1. Define what are d-block elements and write about their electronic configuration
2. Discuss variable oxidation states and magnetic properties of d-block elements
3. Write about catalytic properties and ability to form complexes by d-block elements

Short answer questions

1. Explain the spectral properties(colour) of d-block elements
2. Write about the stability of various oxidation states of d-block elements

UNIT-V CHEMISTRY OF f-BLOCK ELEMENTS

Essay Questions

1. Define what are f-block elements and write about electronic configuration and oxidation states of lanthanides
2. Discuss lanthanide contraction and its consequnces
3. What are actinides and explain about their electronic configuration , oxidation states

Short answer questions

1. What is actinide contraction
2. What are the differences between lanthanides and actinides
3. What are the similarities between lanthanides and actinides
4. Discuss the magnetic properties of lanthanides

	PITHAPUR RAJAH'S GOVERNMENT COLLEGE Kakinada	Program & Semester I B.Sc. Chemistry Hons (II Semester)			
Course Code CHE-IV	TITLE OF THE COURSE **Fundamentals of organic chemistry** **2024-25 AB**				
Teaching	Hours Allocated: 45 (**Theory**)	L	T	P	C
Pre-requisites	Reagents, organic reactions, alkanes, alkenes, alkynes, aromatic nature of benzene	45	10	30	3+1

Course Objectives:

1. Organic Reagents
2. Organic reactions
3. Alkanes, alkenes
4. Alkynes, cycloalkanes
5. Benzene and its reactivity

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Understand the basic concepts of bond fission, organic reagents, organic reaction applications of inductive, mesomeric and hyperconjugation
CO2	Understand the reactions of alkenes
CO3	Understand the reactions of alkynes
CO4	Understand the stability of cycloalkanes
CO5	Apply the concepts of aromaticity to benzenoid and non benzenoid compounds and reactions of benzene

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

Syllabus:

UNIT - I

STRUCTURAL THEORY IN ORGANIC CHEMISTRY

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

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.

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

UNIT-II: ACYCLIC HYDROCARBONS

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.

UNIT-III: ALKYNES

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 X_2, HX, H_2O (Tautomerism), Oxidation with $KMnO_4$, OsO_4, reduction and Polymerisation reaction of acetylene.

UNIT-IV : ALICYCLIC HYDROCARBONS (CYCLOALKANES)

Nomenclature, Preparation by Freunds method, Wislicenus method. Properties - reactivity of cycloalkanes 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

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 NO_2 and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens (Explanation by taking minimum of one example from each type)

Reference & Text books:

1. Organic Chemistry by Morrisson and Boyd
2. A Text Book of Organic chemistry by I L Finar Vol I

Weightage to content
Semester -II
Paper-IV

S.No	Course Content	Long Answer	Short Answer	Total marks	As per Blooms Taxonomy
1	Unit-1	1	2	20	Understanding, Application
2	Unit-2	1	2	20	Remembering, Understanding
3	Unit-3	1	1	15	Application & Creation
4	Unit-4	1	1	15	Remembering, Understanding
5	Unit-5	2	1	25	Application & Creation
	TOTAL	**6**	**7**	**95**	

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (A) :: KAKINADA

I YEAR B.Sc Organic Chemistry Hons (2024-25 AB)
(Examination at the end of II semester)
Paper-IV :: Fundamentals of Organic Chemistry
MODEL PAPER

Duration: 2hrs **Max. Marks: 50**

PART- A

Answer any **THREE** of the following questions by choosing at least **ONE** from each section.
Each carries **TEN** marks 3 X 10 = 30 M

SECTION -A

1. Unit - I
2. Unit - II
3. Unit – V

SECTION -B

4. Unit - III
5. Unit - IV
6. Unit – V

PART- B

Answer any **FOUR** questions. Each carries FIVE marks 4 X 5 = 20 Marks

7. Unit – I
8. Unit – I
9. Unit – II
10. Unit - II
11. Unit – III
12. Unit – IV
13. Unit – V

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (A) :: KAKINADA
I YEAR B.Sc Organic Chemistry Hons (2024-25 AB)
(Examination at the end of II semester)
Practical Paper – IV :: Organic Functional Group Reactions

Credits: 01 30 hrs (2 h / W) **50Marks**

Course outcomes:

On completion of the course, the student will be able to:

1) Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
2) Engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately.
3) Dispose of chemicals in a safe and responsible manner.
4) Understand how the functional groups reacts with different reagents

Syllabus

Reactions of the following functional groups present in organic compounds (at least 4)

Alcohols, phenols, aldehydes, ketones, carboxylic acids and Amines

Co-curricular activities and assessment methods:

1. Continuous Evaluation: Monitoring the progress of student's learning

2. Class Tests, Worksheets 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 .

Scheme of Evaluation

S.No	Content	Marks
1	Preliminary tests State + colour + odour Flame test + Litmus test + Solubility + Unsaturation	10 2 2 + 2 + 2 + 2
2	Identification tests	20
3	Confirmation test	8
4	Report	2
5	Viva voce	5
6	Record	5