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		9441236409
Dr. B. Ramesh Babu		9701712028
Sri. V. Mallikarjuna Sarma		9676822550
Dr. D. Chenna Rao		9560740108
V. Sanjeeva Kumar		9849324966
T. V. V. Satyanarayana		9490876913
P. Vijay Kumar		9652023082
V. Ram babu		9948485537
G. Pavani		9701877823
Dr. T. Uma Maheswara Rao		9247714077
Dr. N. Bujji Babu		9441394792
Dr. Ch. Praveen		9491185518
V. Venkateswara Rao		9885165588
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 Hydrololgy, 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 VIII-A-2 VIII-A-3 Practical Practical Project	 100 100 100 50 50 50	 03 03 03 02 02 02
		VIII (B)**	**Cluster Electives - II ::** VIII-B-1 VIII-B-2 VIII-B-3 Practical Practical Project	 100 100 100 50 50 50	 03 03 03 02 02 02

		VIII (C)**	**Cluster Electives - III ::** VIII-C-1 VIII-C-2 VIII-C-3 Practical Practical Project	 100 100 100 50 50 50	 03 03 03 02 02 02

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 DEGREE COLLEGE (A), KAKINADA

DEPARTMENT OF CHEMISTRY

BOARD OF STUDIES: 2021-22

SECOND YEAR, SEMESTER– III

Paper III (ORGANIC & SPECTROSCOPY) 60 h (4 h / w)

ORGANIC CHEMISTRY 30 h (2h / w)

UNIT I:

1. Chemistry of Halogenated Hydrocarbons:

Alkyl Halides: Methods of preparation and properties, nucleophilic substitution reactions– S_N1, S_N2 mechanisms with stereo chemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination, Williamson's synthesis. Aryl Halides: Preparation (including preparation from diazonium salts) and properties, nucleophilic aromatic substitution; Relative reactivity of alkyl, allyl, benzyl, vinyl and aryl halides towards nucleophilic substitution reactions.
Additional Input: S_Ni mechanisms, S_N Ar, Benzyne mechanism.

2. Alcohols & Phenols Alcohols:

Preparation, properties and relative reactivity of 1°, 2°, 3° alcohols, Bouveault-Blanc Reduction; Oxidation of Diols by Periodic Acid and lead Tetraacetate, Pinacol- Pinacolone Rearrangement; Phenols: Preparation and Properties; Acidity and Factors Affecting it, Ring substitution reactions, Reimer–Tiemann and Kolbe's–Schmidt Reactions.
Additional Input: Fries and Claisen Rearrangement with mechanism.

UNIT II:

Carbonyl Compounds:

Structure, reactivity, preparation and properties; Nucleophilic Addition, Nucleophilic Addition-elimination reactions with ammonia derivatives, Mechanisms of Aldol and Benzoin Condensation, Claisen-Schmidt, Perkin, Cannizzaro and Wittig reaction, Beckmann Haloform Reaction and Baeyer-Villiger oxidation, α- substitution reactions, oxidations and reductions (Clemmensen, Wolf–Kishner, with $LiAlH_4$ & $NaBH_4$).
Additional Input: Addition Reactions of α, β unsaturated carbonyl compounds: Michael Addition.

UNIT III:

Carboxylic Acids and their Derivatives:

General methods of preparation, physical properties and reactions of mono carboxylic acids, effect of substituent acidic strength. Typical reactions of carboxylic acids, hydroxy acids and unsaturated acids. Preparation and Reactions of Acid Chlorides, anhydrides, esters and amides; Comparative study of nucleophilic substitution at acyl group-Mechanism of acidic and alkaline hydrolysis of esters, Claisen Condensation, Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schmidt reaction.

Additional Input: Arndt- Eistert synthesis, halogenations by Hell- Volhard- Zelensky reaction.

SPECTROSCOPY 30 h (2h / w)

UNIT IV:

Molecular Spectroscopy: Interaction of electromagnetic radiation with molecules and various types of spectra;

Rotation spectroscopy: Selection rules, intensities of spectral lines.

Vibrational Spectroscopy: Classical Equation of Vibration, computation of force constant, Harmonic and anharmonic oscillator, Morse Potential curve, Selection rules for vibrational transitions.

Electronic spectroscopy: Energy levels of molecular orbitals (σ, π, n). Selection rules for electronic spectra. Types of electronic transitions in molecules, effect of conjugation. Concept of chromophore. Bathochromic and hypsochromic shifts. Beer-Lambert's law and its limitations.

Nuclear Magnetic Resonance (NMR) spectroscopy: Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples – ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate and acetophenone.

Additional Input: Determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution. Fundamental Frequencies and overtones.

UNIT V:

Application of Spectroscopy to Simple Organic Molecules

Application of visible, ultraviolet and infrared spectroscopy in organic molecules. Application of electronic spectroscopy and Woodward rules for calculating λ_{max} of conjugated dienes and α, β – unsaturated compounds.

Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR Spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones and carboxylic acids.

REFERENCE BOOKS:

1. A TextBook of Organic Chemistry by Bahl and Arunbahl
2. A Textbook of Organic chemistry by I L FinarVol I
3. Organic chemistry by Bruice
4. Organic chemistry by Clayden
5. Spectroscopy by William Kemp
6. Spectroscopy by Pavia
7. Organic Spectroscopy by J. R. Dyer
8. Elementary organic spectroscopy by Y.R. Sharma
9. Spectroscopy by P.S.Kalsi
10. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
11. Spectrometric Identification of Organic Compounds by Robert M Silverstein, Francis X Webster
12. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry,5th Ed. Pearson (2012)
13. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis,

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

Practical Paper-III (At the end of Semester-III)

Organic Preparations and IR Spectral Analysis Lab: 50 Marks

Course Outcomes

1. How to use glassware, equipment and chemicals and follow experimental procedures in the laboratory
2. how to calculate limiting reagent, theoretical yield, and percent yield
3. how to engage in safe laboratory practices by handling laboratory glassware, equipment, and chemical reagents appropriately
4. how to dispose of chemicals in a safe and responsible manner
5. how to perform common laboratory techniques including reflux, distillation, recrystallization, vacuum filtration.
6. how to create and carry out work up and separation procedures
7. how to critically evaluate data collected to determine the identity, purity, and percent yield of products and to summarize findings in writing in a clear and concise manner

Organic preparations: 40M

i. Acetylation of one of the following compounds:

amines (aniline) and phenols (β-naphthol, salicylic acid) by any one method:

a. Using conventional method.

b. Using green approach

ii. Benzoylation of amine (aniline)

a. Nitration of any one of the following: Acetanilide/nitrobenzene by conventional method

b. Salicylic acid by green approach (using ceric ammonium nitrate).

IR Spectral Analysis: 10M

IR Spectral Analysis of the following functional groups with examples

a) Hydroxyl groups

b) Carbonyl groups

c) Amino groups

d) Aromatic groups

P. R. GOVERNMENT COLLEGE, KAKINADA
MODEL PAPER FOR SEMESTER – III (CHEMISTRY)
Paper III (ORGANIC CHEMISTRY& SPECTROSCOPY)

Duration: 2hrs.30 Min **Max. Marks: 60**

PART- A

Answer any Four of the following questions. Each carries FIVE marks 4 X 5 = 20 Marks

1. Question from Unit –I
2. Question from Unit –II
3. Question from Unit –III
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

Answer ALL the questions. Each carries TEN marks 4 X 10 = 40 Marks

9. Question from Unit –I
   (OR)

   Question from Unit –I

10. Question from Unit –II
    (OR)

    Question from Unit – III

11. Question from Unit –IV
    (OR)

    Question from Unit – IV

12. Question from Unit – V
    (OR)

    Question from Unit – V

WEIGHTAGE TO THE COURSE CONTENT

Second Year Semester - III

ORGANIC AND SPECTROSCOPY - III

Sl. No.	COURSE CONTENT	ESSAY	SHORTS	Total Marks
1	UNIT - I	2	1	25
2	UNIT - II	1	1	15
3	UNIT - III	1	2	20
4	UNIT - IV	2	2	30
5	UNIT - V	2	2	30
Total		**8**	**8**	**120**

***

P.R. GOVERNMENT DEGREE COLLEGE (A), KAKINADA

DEPARTMENT OF CHEMISTRY BOARD OF STUDIES: 2021-22

SECOND YEAR, SEMESTER– III

Paper: III- Organic and Spectroscopy

Question Bank

Unit-I

Essay Questions

1. Explain SN^1 & SN^2 reactions with mechanism?
2. Explain the following reaction mechanisms
   a. Reimer –Tiemann reaction b) Kolbe-Schmidt reaction
3. Explain the following reaction mechanisms
   a. Fries rearrangement b) Pinacol – Pinacalone rearrangement

Short answer questions

1. Explain the following terms

a) Walden inversion b) Racemicmixture

2. Write any two preparation methods of Alcohols?
3. Write any two preparation methods of phenols?
4. Explain the identification tests of Primary, Secondary & Tertiary alcohols.

Unit-II

Essay Questions

1. Explain the following reactions with mechanism
   a) Aldol condensation. b) Cannizaro reaction
2. Explain the following reactions with mechanism
   a) Perkin reaction. b) Benzoin condensation
3. Explain the following reactions:
   a) Haloform reaction b) Bayer - villeger oxidation

Short answer questions

1. Write any two preparation methods of carbonyl compounds?
2. Explain the nucleophilic addition reactions of carbonyl compounds?
3. Explain the following reactions:
   a) Clemensen reduction. b) Wolf-Kishner reduction.

Unit-III

Essay Questions

1. Explain the following reactions with mechanism

a) Huns - diecker's reaction b) Schmidt reaction

2. Write any two preparation methods of carboxylic acids and write the chemical Properties?

Short answer questions

1. Write any two chemical properties of carboxylic acids?
2. Explain hydrogen bonding in carboxylic acid
3. Explain Claisen condensation with mechanism?

Unit-IV

Essay Questions

1. Explain Lambert's law and Lambert's – Beers law.
2. Explain the selection rules for electronic spectra.
3. What are Electronic Transitions? Explain various types of Electronic transitions.
4. What is principle of NMR spectroscopy and Write the applications of NMR spectroscopy?

Short answer questions

1. Explain a) Chromophore b) Auxochrome.
2. Explain various types of Spectra?
3. What are equivalent protons and Non-equivalent protons?
4. Explain spin-spin Coupling?
5. What is Chemical shift? How it is calculated?
6. What is coupling constant?

Unit-V

Essay Questions

1. Explain the Various types of molecular vibrations?
2. Write Woodward rules for calculating λ_{max} of conjugated dienes?
3. Write Woodward rules for calculating λ_{max} of α, β – unsaturated compounds.

Short answer questions

1. Explain Fingerprint region of IR Spectroscopy?
2. Write the Applications of UV-Visible Spectroscopy?
3. Discuss about the IR Spectra of alcohols?
4. Discuss about the IR Spectra of Carboxylic Acids?