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 Kakinada				Program & Semester II B.Sc. Organic Chemistry Hons (III Semester)
Course Code CHE-V	TITLE OF THE COURSE INORGANIC CHEMISTRY 2023-24 AB				
Teaching	Hours Allocated: 45 (Theory)	L	T	P	C
Pre-requisites	Bonding in metals, Metal carbonyls, Coordination chemistry, spectral, magnetic and stability of metal complexes	45	10	30	3+1

Course Objectives:

1. Bonding in metals
2. Metal carbonyls
3. Coordination chemistry
4. Spectral, magnetic and stability of metal complexes

Course Outcomes:

	On Completion of the course, the students will be able to
CO1	Understand the basic concepts of Metals, Conductors, insulators
CO2	Understand the basic concepts and structure of Metals carbonyls
CO3	understand the concept of Coordination Compounds.
CO4	understand the properties of complex compounds

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

Syllabus:

UNIT-I :

THEORIES OF BONDING IN METALS:

Metallic properties and its limitations, Valence bond theory, Free electron theory, Explanation of thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors and insulators.

UNIT- II :

METAL CARBONYLS :

Introduction 18 e Rule EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls of V, Cr, Mn, Fe, Co and Ni.

UNIT-III :

COORDINATION CHEMISTRY:

IUPAC nomenclature - bonding theories - Review of Werner's theory and Sidgwick's concept of coordination - Valence bond theory - geometries of coordination numbers 4-tetrahedral and square planar and 6-octahedral and its limitations, crystal filed theory - splitting of d-orbitals in octahedral, factors affecting crystal-field splitting energy, merits and demerits of crystal-field theory. Isomerism in coordination compounds - structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers.

Unit-4 : SPECTRAL AND MAGNETIC PROPERTIES OF METAL COMPLEXES:

Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility-Gouy method.

Unit-5: STABILITY OF METAL COMPLEXES:

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

Unit No	Additions	Deletions	Remarks as per Blooms Taxonomy
1			
2			
3			
4			
5			

Reference & Text books:

1. Concise coordination chemistry by Gopalan and Ramalingam
2. Coordination Chemistry by Basalo and Johnson

3. Concise Inorganic Chemistry by J.D.Lee

4. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan

Weightage to content
Semester -III
Paper-V

S.No	Course Content	Long Answer	Short Answer	Total marks	As per Blooms Taxonomy
1	Theories Of Bonding In Metals	1	2	20	Understanding, Application
2	Metal Carbonyls	1	1	15	Remembering, Understanding
3	Coordination Chemistry	2	1	25	Application & Creation
4	Spectral and Magnetic Properties of Metal Complexes	1	1	15	Remembering, Understanding
5	Stability of Metal Complexes	1	2	20	Application & Creation
	TOTAL	**6**	**7**	**95**	

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

II YEAR B.Sc Organic Chemistry Hons (2023-24 AB)
(Examination at the end of III semester)
Paper-V :: INORGANIC 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 carrie marks

3 X 10 = 30 M

SECTION -A

1. Unit - I
2. Unit - II
3. Unit – III

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 – III
11. Unit – IV
12. Unit – V
13. Unit – V

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

II YEAR B.Sc Organic Chemistry Hons (2023-24 AB)
(Examination at the end of III semester)

LABORATORY COURSE
Practical Paper – V :: Inorganic Chemistry

Credits: 01

(at the end of semester III) 30 hrs (2 h / W) **50Marks**

Titrimetric Analysis 50 M

1. Determination of Fe (II) using $KMnO_4$ with oxalic acid as primary standard.
2. Determination of Cu (II) using $Na_2S_2O_3$ with $K_2Cr_2O_7$ as primary standard

	PITHAPUR RAJAH'S GOVERNMENT COLLEGE KAKINADA	Program & Semester			
Course Code **CHE-6**	TITLE OF THE COURSE **COURSE 6: ORGANIC CHEMISTRY**	II B.Sc.HONORS (III Semester)			
Teaching	Hours Allocated: 45(**Theory**)	L	T	P	C
Pre-requisites	Fundamental Knowledge in functional Groups of organic compounds and their general formulas	45	10	30	3+1

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Handle indepth of various named reactions with mechanism
CO2	Understand the basic concepts of Hydroxy Compounds
CO3	Learn and identify halogen compounds, hydroxy compounds, carbonyl and carboxylic acids, active methylene compounds
CO4	Understand the reactivity and structure of different functional groups of compounds

Course with focus on employability/entrepreneurship/SkillDevelopment modules

Skill Development		Employability		Entrepreneurship	

Syllabus

UNIT – I

HALOGEN COMPOUNDS

Nomenclature and classification of alkyl (into primary, secondary, tertiary), aryl, alkyl, allyl, vinyl, benzyl halides. Nucleophilic aliphatic substitution reaction- classification into SN^1 and SN^2 – reaction mechanism with examples – Ethyl chloride, t-butyl chloride and optically active alkyl halide 2-bromobutane.

UNIT-II

HYDROXY COMPOUNDS

Nomenclature and classification of hydroxy compounds. Alcohols: Preparation with hydroboration reaction, Grignard synthesis of alcohols. Phenols: Preparation i) from diazonium salt, ii) from aryl sulphonates, iii) from cumene. Physical properties- Hydrogen bonding (intermolecular and intramolecular). Effect of hydrogen bonding on boiling point and solubility in water.

Identification of alcohols by oxidation with $KMnO_4$, Ceric ammonium nitrate, Luca's reagent and phenols by reaction with $FeCl_3$.Chemical properties:Dehydration of alcohols.Oxidation of alcohols by CrO_3, $KMnO_4$.c) Special reaction of phenols: Riemer-Tiemann reaction, Pinacol-Pinacolone rearrangement.

UNIT-III

CARBONYL COMPOUNDS

Nomenclature of aliphatic and aromatic carbonyl compounds, structure of the carbonyl group. Synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties: Reactivity of carbonyl group in aldehydes and ketones.

Nucleophilic addition reaction with a) $NaHSO_3$, b) HCN, c) RMgX, d) NH_2OH, e)$PhNHNH_2$, f) 2,4 DNPH, g. Base catalysed reactions: a) Aldol, b) Cannizzaro's reaction, c) Perkin reaction, d) Benzoin condensation, e) Haloform reaction, f) Knoevenagel reaction. Oxidation of aldehydes- Baeyer-Villiger oxidation of ketones.Reduction: Clemmensen reduction, Wolf-Kishner reduction, MPV reduction, reduction with $LiAlH_4$ and $NaBH_4$. Analysis of aldehydes and ketones with a) 2,4-DNPH test, b) Tollen's test, c) Fehling test, d) Schiff's test e) Haloform test (with equation)

UNIT-IV

CARBOXYLIC ACIDS

Nomenclature, classification and structure of carboxylic acids. Methods of preparation by a) Hydrolysis of nitriles, amides b) Hydrolysis of esters by acids and bases with mechanism c) Carbonation of Grignard agents Special methods of preparation of aromatic acids by a) Oxidation of side chain. b) Hydrolysis by benzo trichlorides. c) Kolbe reaction. Physical properties: Hydrogen bonding, dimeric association, acidity- strength of acids with examples of trimethyl acetic acid and trichloroacetic acid. Relative differences in the acidities of aromatic and aliphatic acids.Chemical properties: Reactions involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schimdt reaction, Arndt-Eistert synthesis, halogenation by Hell- Volhard- Zelinsky reaction.

UNIT-V:

ACTIVE METHYLENE COMPOUNDS

ACETOACETIC ESTER: keto-enol tautomerism, preparation by Claisen condensation, Acid hydrolysis and ketonic hydrolysis. Preparation of a) monocarboxylic acids b) Dicarboxylic acids. Reaction with urea

MALONIC ESTER: preparation from acetic acid. **Synthetic applications**: Preparation of a) monocarboxylic acids (propionic acid and n-butyric acid). b) Dicarboxylic acids (succinic acid and adipic acid) c) α,β - unsaturated carboxylic acids (crotonic acid) d) Reaction with urea.

Textbooks

S.NO	AUTHOR	TITLE	PUBLISHER
1	O.P Agarwal	Unified Chemistry	JPNP publications
2	Bhal and Arun Bhal	Text book of Advaced organic chemistry	S.Chand publications

Reference books

S.NO	AUTHOR	TITLE	PUBLISHER
1	Bahl and Arun bahl	A Text Book of Organic Chemistry	S.Chand publications
2	I L Finar Vol I	A Text Book of Organic chemistry	Person Education India, 6th Edition
3.	Bruice	Organic chemistry	Pearson Education, Noida
4.	Clayden	Organic chemistry	Oxford University Press

Course outcome & Program outcome mapping

On Completion of the course, the students will be able to	
CO1	In depth understanding of Structural theory in Organic chemistry

CO2	Understand and explain preparations and properties of phenols,carboxylic acids and active methylene compounds
CO3	Learn and identify Aromaticity character of Organic compounds with reference tophenols,carboxylic acids, carbonyl compounds in a mechanistic and synthesis path.
CO4	To understand and apply the basic principles of structural chemistry for structure and reactivity of aldehydes, ketones, alkyl halides, carboxylic acids and active methylene compounds

CO-PO Mapping:

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 content

S.No	Course Content	Long Answer	Short Answer	Total marks	As per Blooms Taxonomy
1	**HALOGEN COMPOUNDS**	1	1	15	Understanding, Application
2	**HYDROXY COMPOUNDS**	1	2	20	Remembering, Understanding
3	**CARBONYL COMPOUNDS**	2	2	30	Analyzing & Creation
4	**CARBOXYLIC ACIDS**	1	1	15	Evaluation, Understanding
5.	**ACTIVE METHYLENE COMPOUNDS**	1	1	15	Understanding, Application
	TOTAL	**6**	**7**	**95**	

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (A), KAKINADA

II YEAR B.Sc (Examination at the end of III semester)

COURSE – 6 :: ORGANIC CHEMISTRY MODEL PAPER

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

Section – 1

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

Part -A

1. Define Nucleophilic reactions? Apply the concept of SN1 mechanism to explain the nucleophilic substitution reaction with example. BT1 & BT3
2. What are phenols? Explain the preperation of phenols from diazonium salts and cumene
3. State Benzoin reaction ? Discuss the formation of benzoin with mechanism BT1 & BT2

Part-B

4. Explain the following
   a) Wolf-Kishner reduction BT3
   b) Baeyer-Villiger oxidation BT2
5. Write preparation method for ethyl aceto acetate ? Discuss the acid hydrolysis and ketonic hydrolysis of ethyl acetoacetae BT3
6. Elaborate the mechanism of Hydrolysis of esters by acids and bases with mechanism BT3

Section - II

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

7. Write a brief note on classification of alkyl halides with suitable examples BT1
8. Subdivide alcohols with suitable examples. BT4
9. Explain haloform reaction with suitable example BT2
10. Discuss the acidic nature of carboxylic acids BT2
11. Elaborate aldol condensation with example BT3
12. Write a brief note on pinacole-pinacalone rearrangement reaction BT1
13. Interpret keto-enol tautomerism in malonic ester with explanation? BT2

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (A), KAKINADA

II YEAR B.Sc HONORS (Examination at the end of III semester)

COURSE – 4 :: Organic Chemistry

QUESTION BANK

ESSAY QUESTIONS

Unit:1

1. Define Nucleophilic reactions? Apply the concept of SN1 mechanism to explain the nucleophilic substitution reaction with example.

2. Explain SN2 mechanism in alkyl halides with suitable example

3. Discuss the nucleophile substitution in vinyl, allyl and benzyl halides

Unit: II

1. What are phenols? Explain the preperation of phenols from diazonium salts and cumene

2. Write about the preperation of alcohols by hydroboration and grignard synthesis

3. Discuss the effect of hydrogen bonding on boiling point and solubility of alcohols and phenols in water.

4. How to identify alcohols with $KMnO_4$ and phenols with $FeCl_3$

5. Write about the following special reaction of phenols:

   a) Riemer-Tiemann reaction

   b) Pinacol-Pinacolone rearrangement

Unit: III

1. State Benzoin reaction ? Discuss the formation of benzoin with mechanism
2. Explain the following

   a) Wolf-Kishner reduction b) Baeyer-Villiger oxidation
3. Write about the synthesis of aldehydes and ketones from acid chlorides and 1,3 dithaines
4. Discuss the nucleophilic addition reactions in carbonyl compounds with any three reagents
5. Write about the following

   a) Cannizzaro's reaction, b) Perkin reaction

Unit: IV

1. Elaborate the mechanism of Hydrolysis of esters by acids and bases with mechanismDiscuss the conformational structures of cyclopentane and cyclohexane
2. Write about Huns-Diecker reaction, decarboxylation by Schimdt reaction,
3. Discuss about Arndt-Eistert synthesis, halogenation by Hell- Volhard-Zelinsky reaction.
4. Discuss the relative differences in the acidities of aromatic and aliphatic carboxylic acids.

Unit: V

1. Write preparation method for ethyl aceto acetate ? Discuss the acid hydrolysis and ketonic

hydrolysis of ethyl acetoacetae

2. Discuss the preperation of malonic ester from acetic acid and write any two applications of malonic ester

SHORT ANSWER QUESTIONS

Unit:1

1. Write a brief note on classification of alkyl halides with suitable examples
2. Explain nucleophilic substitution in aryl halides

Unit: 1I

1. Subdivide alcohols with sutiable examples.
2. Write a brief note on identification of alcohols with ceric ammonium nitrate
3. What is Lucas reagent and how it is useful in identification of alcohols
4. Write a short note on dehydration of alcohols with chemical equation

Unit: III

1. Explain haloform reaction with suitable example
2. Elaborate aldol condensation with example

Unit: IV

1. Discuss the acidic nature of carboxylic acids
2. Compare the acidic strength of trimethyl acetic acid with trichloro acetic acid

Unit: V

1. Interpret keto-enol tautomerism in malonic ester with explanation?
2. Write about the reaction between urea and malonic acid

SEMESTER-III
COURSE 6: ORGANIC CHEMISTRY

Practical Credits: 1 2 hrs/week

Practical- Organic Qualitative Analysis

(At the end of III Semester)

Systematic qualitative analysis of organic compounds

phenols, carbonyl compounds like Aldehyde and ketone,carboxylic acid, amine, carbohydrate,amide and Urea

Scheme of Valuation for Practical

Physical State -2M

Odour-2M

Colour-2M

MP/BP-1M

Solubility-3M

Ignition test-2M

Saturation/Unsaturation Test- 2+2M

Litmus Test-2M

Extra element Detection-5M(Including preperation of SFE)

Identification of Functional Group-5M

Confirmation Tests for functional Group-5+5M

Report-2M

Record-

	Pithapur Rajah's Government College(Autonomous) Kakinada	Program &Semester II B.Sc Organic Chemistry Major & Semester-III (Course-7)			
CourseCode	PHYSICAL CHEMISTRY				
Teaching	**Hours Allocated: 45** **(Theory)**	**L**	**T**	**P**	**C**
Pre-requisites:	General Properties of Matter, States of Matter, Characteristics of Gases, Liquids, Solids, Solutions, etc.	45	10	30	3+2

Course Objectives

To gains knowledge on basic concepts of Solids, Liquids, Gases and solutions.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1	In depth understanding of Various properties of solids
CO2	Understand and explain properties of Gases
CO3	Learn about the Properties of Liquids and applications of Liquid Crystals.
CO4	To understand the properties of solutions and basic principles of Ionic equilibrium.

Course with focus on employability / entrepreneurship / Skill Development modules

Skill Development			Employability			Entrepreneurship	

SYLLABUS

UNIT-I

SOLID STATE:

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Definition of lattice point, space lattice, unit cell. X-ray diffraction and crystal structure. Bragg's law. Defects in crystals. Stoichiometric and non-stoichiometric defects.

UNIT-II

GASEOUS STATE

Introduction and derivation of Ideal Gas Equation. Vander Waal's equation of state. P-V Isotherms of real gases, Andrew's isotherms of carbon dioxide. Critical phenomena. The

equation and the critical state. Law of corresponding states. Relationship between critical constants and vander Waal's constants. Joule Thomson effect.

UNIT-III

LIQUID STATE

Structural differences between solids, liquids and gases. Liquid crystals, the mesomorphic state. Classification of liquid crystals into Smectic and Nematic. Differences between liquid crystal and solid/liquid. Application of liquid crystals as LCD devices.

UNIT-IV

SOLUTIONS

Liquid-liquid - ideal solutions, Raoult's law. Ideally dilute solutions, Henry's law. Non-ideal solutions. Azeotropes-HCl-H2O, ethanol-water systems and fractional distillation. Partially miscible liquids-phenol-water. Effect of impurity on consulate temperature. Immiscible liquids and steam distillation. Nernst distribution law. Calculation of the partition coefficient. Applications of distribution law.

UNIT-V

IONIC EQUILIBRIUM AND HSAB

Ionic Product, common ion effect, solubility, and solubility product. Definition of acid and basis with examples, Pearson concept, HSAB Principle & it's importance definition of buffer solution. Henderson – Hassel batch Equation.

Text Books & Reference Books

S. No	Author	Title	Publisher
1	Prutton and Marron	Principles of physical chemistry	-.
2	Anthony R. West	Solid State Chemistry and its applications	-
3	K L Kapoor	Text book of physical chemistry	-
4	S Glasstone	Textbook of physical chemistry	-
5	Bahl and Tuli	Advanced physical chemistry	-

Web Links:

CO-PO Mapping:

On Completion of the course, the students will be able to-	
CO1	In depth understanding of Various properties of solids
CO2	Understand and explain properties of Gases
CO3	Learn about the Properties of Liquids and applications of Liquid Crystals.
CO4	To understand the properties of solutions and basic principles of Ionic equilibrium.

1: Low=1; 2: Moderate=2; 3: High=3; 4: No Correlation=0

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3
CO1	3	3	3	2	1	1	2	1	1	1	3	3	2
CO2	3	3	3	2	2	1	2	1	1	1	3	3	3
CO3	3	3	3	2	1	1	1	1	1	1	3	3	3
CO4	2	1	2	2	1	2	2	2	2	2	1	2	1

Program 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 modelling and analyse 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 CONTENT
SEMESTER -III
PAPER-VII

S. No	Course Content	Long Answer	Short Answer	Total marks	As per Blooms Taxonomy
1	Solid State	1	2	20	Understanding, Application
2	Liquid State	1	1	15	Remembering, Understanding
3	Gases State	1	1	15	Application & Creation
4	Solutions	2	1	25	Remembering, Understanding
5	Ionic Equilibrium and HSAB	1	2	20	Application & Creation
	TOTAL	**6**	**7**	**95**	

PAPER-VII: Physical Chemistry Semester - III PRACTICAL – VII : Credits: 1

Preparations of solutions 1. 1M HCl 1M CH3COOH 1M H2SO4, 1M NaOH & calibration of volumetric apparatus and statistical analysis of the data.

3. preparation of reagents: Starch Solutions, Schiff's reagent, Tollen's Reagent, Fehling's Reagent, Phenolphthalein indicators.

4. Determination of rate constant for acid catalyzed ester hydrolysis.

Co-Curricular Activities: Mandatory:(Lab/field training of students by teacher:(lab:10+field:05):

For Teacher: Training of students by teacher in laboratory and field for not less than15 hours on the field techniques/skills of Preparation of Standard Solutions.

For Student: Student shall visit a related industry/chemistry laboratory in universities/research organizations/private sector facility and observe the techniques used for Calibration of Various Volumetric Appratus. Write their observations and submit a handwritten fieldwork/project work report not exceeding10 pages in the given format to the teacher. Max marks for Fieldwork/project work Report:05. Suggested Format for Fieldwork/project work: Title page, student details, index page, details of place visited, observations, findings, and acknowledgements. Unit tests (IE). a)

Suggested Co-Curricular Activities

4. Training of students by related industrial experts.

5. 2. Assignments, Seminars and Quiz (on related topics), collection of videos and other material

6. Visits of facilities, firms, research organizations etc.

4. Invited lectures and presentations on related topics by field/industrial experts.

PITHAPUR RAJAH'S GOVERNMENT COLLEGE(A), KAKINADA. B.SC.-PETROCHEMICALS

MODEL QUESTIONPAPER

PAPER –VII: PETROCHEMICALS – II

Time: 2 Hrs. Max. Marks 50

PART-I

Answer any THREE questions by attempting at least ONE question from each section.
Each Question carries TEN marks. **3X10=30M**

SECTION – A

1. Derive Bragg's Law. Explain the determination of structure of a crystal by powder method?
2. Why do real gases deviate from ideal gas behaviour? Derive Vander Waal's equation of state?
3. What are liquid Crystals? Explain types of Liquid crystals.

SECTION – B

4. What is Critical Solution temperature? Explain Critical solution temperature for Phenol – water system.
5. State and explain Nernst distribution Law. Write its limitations. Explain the applications of Nernst distribution Law.
6. Discuss the HSAB Principle and write its importance.

PART-II

Answer any FOUR Questions from the following.
Each Question carries FIVE marks. **4 x 5 =20M**

7. Define lattice point, space lattice and unit cell?
8. What is Inversion Temperature? Give Examples
9. Explain applications of liquid crystals as LCD devices?
10. Explain Raoult's law?
11. Discuss the common ion effect and its impact on the solubility of salts.
12. Write a note on Stoichiometric defects in crystals.
13. Define solubility and solubility product. How are they related to each other?

PITHAPUR RAJAH'S GOVERNMENT COLLEGE(A), KAKINADA.

B.SC., Organic Chemistry

QUESTION BANK

PAPER –VII: PHYSICAL CHEMISTRY

UNIT-I

ESSAY QUESTIONS

1. Derive Bragg's Law. Explain the determination of structure of a crystal by powder method?
2. Explain symmetry elements in crystals.
3. Explain the stoichiometric and non-stoichiometric defects 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. Define lattice point, space lattice and unit cell?

UNIT – II

ESSAY QUESTIONS

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

SHORT ANSWER QUESTIONS

1. What is Inversion Temperature? Give Examples.
2. Write about Law of corresponding states.

UNIT – III

ESSAY QUESTIONS

1. What are liquid Crystals? Explain types of Liquid crystals.
2. Classify liquid crystals into Smectic and Nematic phases. Describe the molecular arrangements and properties of each phase.

SHORT ANSWER QUESTIONS

1. Explain applications of liquid crystals as LCD devices?
2. Write the differences between liquid crystals and liquids/solids?

UNIT – IV

ESSAY QUESTIONS

1. What is Critical Solution temperature? Explain Critical solution temperature for Phenol – water system.
2. Explain the concept of azeotropes using the HCl-H_2O and ethanol-water systems as examples. Discuss how azeotropes affect fractional distillation processes.
3. State and explain Nernst distribution Law. Write its limitations. Explain the applications of Nernst distribution Law.

SHORT ANSWER QUESTIONS

1. Write a brief note on Henry Law?
2. Explain Raoult's law?

3. What is an azeotrope, and how does it differ from a regular solution?
4. What are Ideal and Non Ideal solutions give examples.

UNIT-V

ESSAY QUESTIONS

1. Discuss the HSAB Principle and write its importance.
2. Define buffer solution and Explain how buffers resist changes in pH using the Henderson-Hasselbalch Equation.

SHORT ANSWER QUESTIONS

1. Explain briefly Common ion effect & Solubility product?
2. Define solubility and solubility product. How are they related to each other?
3. Define acids and bases according to the Arrhenius, Bronsted-Lowry, and Lewis theories. Discuss the common ion effect and its impact on the solubility of salts.

	PITHAPUR RAJAH'S GOVERNMENT COLLEGE KAKINADA	Program & Semester			
Course Code **CHE-8**	TITLE OF THE COURSE **COURSE 8: GENERAL CHEMISTRY**	II B.Sc.HONORS (III Semester)			
Teaching	Hours Allocated: 45(**Theory**)	L	T	P	C
Pte-requisites	Fundamental Knowledge in Gel Preperation, and Hardy Schultz rule, Adsorption and Absorption.	45	10	30	3+1

Course Outcomes:

On Completion of the course, the students will be able to	
CO1	Handle indepth of various named reactions with mechanism
CO2	**Understand the basic concepts of Colloids, emulsions, and Gels**
CO3	Learn and identify Chemical Bonding, Stereo Chemistry of Carbon compounds-I & II
CO4	**Understand the concept of VBT and LCAO Method.**

Course with focus on employability/entrepreneurship/SkillDevelopment modules

Skill Development		Employability		Entrepreneurship	

SYLLABUS

UNIT-I COLLOIDS:

Definition of colloids. Solids in liquids(sols), preparation, properties - kinetic, optical, electrical. Stability of colloids, Hardy-Schulze law, protective colloid.

Liquids in liquids (emulsions) preparation, properties, uses. Liquids in solids (gels) preparation, uses.

UNIT-II ADSORPTION:

Physical adsorption, chemisorption. Freundlisch, Langmuir adsorption isotherms. Applications of adsorption, difference between physical adsorption and chemical adsorption

UNIT-III

CHEMICAL BONDING:

Valence bond theory, hybridization, VB theory as applied toClF_3, $Ni(CO)_4$, Molecular orbital theory - LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N_2, O_2, CO and NO).

UNIT-IV

STEREOCHEMISTRY OF CARBON COMPOUNDS-I:

Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae.Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation.

UNIT-V

STEREOCHEMISTRY OF CARBON COMPOUNDS-II

Chiral molecules- definition and criteria(Symmetry elements)- Definition of enantiomers and diastereomers – Explanation of optical isomerism with examples Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3- dibromopentane.

D,L and R,S configuration methods and E,Z- configuration with examples.

extbooks

S.NO	AUTHOR	TITLE	PUBLISHER
1	O.P Agarwal	Unified Chemistry	JPNP publications
2	Bhal and Arun Bhal	Text book of Advaced organic chemistry	S.Chand publications

Reference books

S.NO	AUTHOR	TITLE	PUBLISHER
1	K L Kapoor	Text book of physical chemistry	Macmillan publishers india Limited,2004
2	S Glasstone	Text book of physical chemistry	D. Van Nostrand Company, inc
3.	E L Eliel	Stereochemistry of Organic compounds	Wiley
4.	F A Carey and R J Sundberg	Advanced Organic Chemistry	
5.	P.S.Kalsi	Stereochemistry	
6.	D. Nasipuri	Stereochemistry of Organic	

		compounds	
7.	Bahl and Tuli	Advanced physical chemistry	

Course outcome & Program outcome mapping

On Completion of the course, the students will be able to	
CO1	In depth understanding of Structural theory in General chemistry
CO2	Understand and explain preparations and properties of colloids and gels
CO3	Learn and identifyemulsion and gel character ofvarious compounds with reference to their applications in a mechanistic and synthesis path.
CO4	To understand and apply the basic principles of stereo chemistry for structure and reactivity of Lactic acid, glyceraldehyde and alanine

CO-PO Mapping:

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 content

S.No	Course Content	Long Answer	Short Answer	Total marks	As per Blooms Taxonomy
1	**COLLOIDS**	1	1	15	Understanding, Application
2	**ADSORPTION**	1	1	15	Remembering, Understanding
3	**CHEMICAL BONDING**	1	2	20	Analysizing & Creation
4	**STEREOCHEMISTRY OF CARBON COMPOUNDS-I**	1	1	15	Evaluation, Understanding
5.	**STEREOCHEMISTRY OF CARBON COMPOUNDS-II**	2	2	30	Understanding, Application
	TOTAL	**6**	**7**	**95**	

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (A), KAKINADA

II YEAR B.Sc (Examination at the end of III semester)

COURSE –8 :: ORGANIC CHEMISTRY MODEL PAPER

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

Section – 1

Answer any three of the following questions. Must attempt at least one question fromeach part. Each question carries 10 Marks. **3 X 10M = 30M**

Part -A

1. Define colloids ? Preperation of colloids by various methods with example. BT1 & BT3
2. What are adsorption isotherms? Explain the Freundlisch adsorption isotherms
3. State MO theory and construction of M.O. diagrams for homo-nuclear molecules N_2 & O_2 BT1 & BT2

Part-B

4. Explain the following
   a) Fischer Projection BT3
   b) Newman Projection BT2
5. Write about D,L and R,S cofiguration methods with suitable example BT3
6. Elaborate the E,Z- configuration with examples BT3

Section - II

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

7. Write a brief note uses of colloids with suitable examples BT1
8. Subdivide physical adsorption from chemical adsorption with suitable examples. BT4
9. Explain hybridisation with ClF_3 molecule BT2
10. Discuss the specific rotation BT2
11. Elaborate the postulates of VB theory BT3
12. Write a brief note on enantiomers BT1
13. Interpret glyceraldehyde as chiral molecule BT2

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (A), KAKINADA

II YEAR B.Sc HONORS (Examination at the end of III semester)

COURSE – 8 :: General Chemistry

QUESTION BANK

ESSAY QUESTIONS

Unit:1

1. Define colloids ? Preparation of colloids by various methods with example.

2 Write about the optical and electrical properties of colloids

3. What is stability of colloids and how to protect unstable colloids

Unit: II

1. What are adsorption isotherms? Explain the Freundlisch adsorption isotherms

2. Explain about Langmuir adsorption isotherms

Unit: III

1. State MO theory and construction of M.O. diagrams for homo-nuclear molecules N_2 & O_2
2. Write about the important postulates of MO theory

3. Construct the MO diagrams of CO and NO

Unit: IV

1. Explain the following

A) Fischer Projection
B) Newman Projection

2. Describe wedge and saw-horse representation for a molecule

Unit: V

1. Write about D,L and R,S cofiguration methods with suitable example

2. Elaborate the E,Z- configuration with examples

SHORT ANSWER QUESTIONS

Unit:1

1. Write a brief note uses of colloids with suitable examples

2. What are Emulsions and give their uses

3. What are protective colloids

Unit: 1I

1. Subdivide physical adsorption from chemical adsorption with suitable examples.

2. What are the applications of adsorption

Unit: III

1. Explain hybridisation with ClF_3 molecule
2. Elaborate the postulates of VB theory
3. Explain the structure of $Ni(CO)_4$

Unit: IV

1. Discuss the specific rotation
2. What is Ordinary light and Optical light

Unit: V

1. Elaborate optical activity with example
2. Interpret glyceraldehyde as chiral molecule
3. Write a brief note on enantiomers
4. What is the criteria for the optical activity of an organic molecule

SEMESTER-III
COURSE 8: GENERAL CHEMISTRY

Practical Credits: 1 2 hrs/week

Practical- General Chemistry Lab

(i) Determination of surface tension of liquid

(ii) Determination of viscosity of liquid

(iii) Determination of molecular status and partition coefficient of benzoic acid in benzene and water

(iv) Adsorption of acetic acid on animal charcoal , verification of Freundlisch isotherm

Scheme of Valuation for Practical

Procedure in first 10mts-10M

Neat tabular forms with tabulation of values-10M

Relevant formula with terms explanation-5M

Record-10M

Marks awarded with error as follows

<10% -15M

10-15%-10M

>15%-5M

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (A), KAKINADA

II YEAR B.Sc (Examination at the end of III semester)

COURSE –8 :: ORGANIC CHEMISTRY MODEL PAPER

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

Section – 1

Answer any three of the following questions. Must attempt at least one question fromeach part. Each question carries 10 Marks. **3 X 10M = 30M**

Part -A

14. Define colloids ? Preperation of colloids by various methods with example. BT1 & BT3
15. What are adsorption isotherms? Explain the Freundlisch adsorption isotherms
16. State MO theory and construction of M.O. diagrams for homo-nuclear molecules N_2 & O_2 BT1 & BT2

Part-B

17. Explain the following
    c) Fischer Projection BT3
    d) Newman Projection BT2
18. Write about D,L and R,S cofiguration methods with suitable example BT3
19. Elaborate the E,Z- configuration with examples BT3

Section - II

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

20. Write a brief note uses of colloids with suitable examples BT1
21. Subdivide physical adsorption from chemical adsorption with suitable examples. BT4
22. Explain hybridisation with ClF_3 molecule BT2
23. Discuss the specific rotation BT2
24. Elaborate the postulates of VB theory BT3
25. Write a brief note on enantiomers BT1
26. Interpret glyceraldehyde as chiral molecule BT2

PITHAPUR RAJAH'S GOVERNMENT COLLEGE (A), KAKINADA

II YEAR B.Sc HONORS (Examination at the end of III semester)

COURSE – 8 :: General Chemistry

QUESTION BANK

ESSAY QUESTIONS

Unit:1

1. Define colloids ? Preperation of colloids by various methods with example.

2 Write about the optical and electrical properties of colloids

4. What is stability of colloids and how to protect unstable colloids

Unit: II

3. What are adsorption isotherms? Explain the Freundlisch adsorption isotherms

4. Explain about Langmuir adsorption isotherms

Unit: III

4. State MO theory and construction of M.O. diagrams for homo-nuclear molecules N_2 & O_2
5. Write about the important postulates of MO theory

6. Construct the MO diagrams of CO and NO

Unit: IV

3. Explain the following

C) Fischer Projection
D) Newman Projection

4. Describe wedge and saw-horse representation for a molecule

Unit: V

3. Write about D,L and R,S cofiguration methods with suitable example

4. Elaborate the E,Z- configuration with examples

SHORT ANSWER QUESTIONS

Unit:1

4. Write a brief note uses of colloids with suitable examples

5. What are Emulsions and give their uses

6. What are protective colloids

Unit: 1I

3. Subdivide physical adsorption from chemical adsorption with suitable examples.

4. What are the applications of adsorption

Unit: III

4. Explain hybridisation with ClF_3 molecule

5. Elaborate the postulates of VB theory

6. Explain the structure of $Ni(CO)_4$

Unit: IV

3. Discuss the specific rotation

4. What is Ordinary light and Optical light

Unit: V

5. Elaborate optical activity with example
6. Interpret glyceraldehyde as chiral molecule
7. Write a brief note on enantiomers
8. What is the criteria for the optical activity of an organic molecule

SEMESTER-III

COURSE 8: GENERAL CHEMISTRY

Practical Credits: 1 2 hrs/week

Practical- General Chemistry Lab

(v) Determination of surface tension of liquid

(vi) Determination of viscosity of liquid

(vii) Determination of molecular status and partion coefficient of benzoic acid in benzene and water

(viii) Adsorption of acetic acid on animal charcoal , verification of Freundlisch isotherm

Scheme of Valuation for Practical

Procedure in first 10mts-10M

Neat tabular forms with tabulation of values-10M

Relevant formula with terms explanation-5M

Record-10M

Marks awarded with error as follows

<10% -15M

10-15%-10M

>15%-5M