A.G& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

VUYYURU-521165, KRISHNA Dt., A.P.(Autonomous)

Accredited by NAAC with "A" Grade

2021-2022

DEPARTMENT OF CHEMISTRY

MINUTES OF BOARD OF STUDIES

EVEN SEMESTER

06-04-2022

Minutes of the Meeting of Board of Studies in Chemistry for the Autonomous Course

A.G. & S.G.Siddhartha Degree College of Arts & Science, Vuyyuru held at 11.00 A.M on 06-04--2022 in the Department of Chemistry.

Sri. K.RAMESH *Presiding*

Members Present:

1)..... (Sri. K.RAMESH)	Chairman	HOD, Dept. of Chemistry, A.G. & S.G.S.Degree College,Vuyyuru.
2)..... (Prof.D.Ramasekhar Reddy)	University Nominee	Assistant Professor, Dept. of Chemistry,Krishna University, MTM.
3)..... (Dr. S. Kalpana)	Academic Council Nominee	HOD, Dept. of Chemistry, SDMS M College, Vijayawada.
4)..... (Smt. A. Indira)	Academic Council Nominee	Lecturer in Chemistry, G.D.C, Dumpagadapa
5)..... (Dr. G Raja)	Industrialist	Manager, Q.A, Biophore india Pharmaceuticals pvt ltd Hyd,
6)..... (Smt. M. Sowjanya)	Student Nominee	Lecturer in Chemistry, ANR College Gudivada.
7)..... (Dr. G.Giri prasad)	Member	Lecturer in Chemistry, A.G. & S.G.S.Degree College,Vuyyuru
8)..... (Smt. M.V.Santhi)	Member	Lecturer in Chemistry, A.G. & S.G.S.Degree College,Vuyyuru.
9)..... (Sri. P.Suresh)	Member	Lecturer in Chemistry, A.G.& S.G.S.Degree College, Vuyyuru.
10)..... (MS. M.Santhi)	Member	Lecturer in Chemistry, A.G.& S.G.S.Degree College,Vuyyuru.
11)..... (Sri. J.Nageswara Rao)	Member	Rtd.Lecturer in Chemistry, A.G.& S.G.S.Degree College,Vuyyuru.

Agenda for B.O.S Meeting

1 .To recommend the syllabus and model paper for II semesterof IDegree B.Sc., Chemistry forthe Academic year 2021-2022.

2. To recommend the syllabus and model papers for IV semester of IIDegree B.Sc., Chemistry for the Academic year 2021-2022.

3. To recommend the syllabus and model papers for VI semester of III Degree B.Sc. Chemistry for the Academic year 2021-2022.

4. To recommend the Blue print of II,IV,VIsemesters of B.Sc. Chemistry for the Academic year 2021--2022.

5. To recommend the Guidelines to be followed by the question paper setters in Chemistry forII,IV,VISemester--end exams.

6. To recommend the teaching and evaluation methods to be followed under Autonomous status.

7. Any suggestions regarding certificate course, seminars, workshops, Guest lecture to be organized.

8. Recommend the panel of paper setters and Examiners to the controller of Examinations of autonomous Courses of A.G. &S.G.S.Degree colleges of Arts & Science, Vuyyuru.

9. Any other matter.

K. Ramesh
Chairman.

RESOLUTIONS

1) It is resolved to Change the **syllabus for II semesters of I B.Sc.** under Choice Based Credit System (CBCS) for the Academic year 2021--2022.
   Adding Syllabus: HSAB Unit-4
2) It is resolved to follow the **syllabus of APSCHE for IV semesters of II B.Sc.** under Choice Based Credit System (CBCS) for the Academic year 2021--2022. II, IV, & VI
   - In this academic year two papers will be introduced i,eCHE-401(Inorganic, Organic and Physical chemistry)& CHE-402(Inorganic, Organic and Physical chemistry)
3) It is resolved to implement the same **syllabus** under Choice Based Credit System for the Academic year 2021-2022 for **VI semester of III B.Sc.**
4) It is resolved to follow the **Blue prints** as proposed by members of BOS II, IV & VI semester of Degree B.Sc.for the Academic year 2021-2022.
5) It is resolved to follow the **guidelines** to be followed by the question paper setters of Chemistry for II,IV& VI semesters of Degree B.Sc. for the Academic Year 2021-2022.
6) It is resolved to continue the following teaching and evolution methods for Academic year 2021-22.

Teaching Methods:

Besides the conventional methods of teaching, we use modern technology i.e. using of LCD projector to display on U boards etc, for better understanding of concepts.

Evaluation of a student is done by the following procedure:

- **Internal Assessment Examinations:**
- Out of maximum 100 marks in each paper for I B.Sc, 25 marks shall be allocated for internal assessment.Out of these 25 marks, 15 marks are allocated for announced tests (i.e.IA-1 & IA-2).
- Out of maximum 100 marks in each paper for II,IIIB.Sc, 30 marks shall be allocated for internal assessment.Out of these 30 marks, **20 marks are allocated for announced tests (i.e.IA-1 & IA-2).**
- Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, **5 marks** are allocated on the basis of candidate's **percentage of attendance and remaining 5 marks are allocated for the innovative component like assignment/quiz/seminars for II,IV,VIB.Sc.**
- There is **no pass minimum** for internal assessment for I, II,III B.Sc.

Semester – End Examination:

- The maximum marks for IB.ScSemester – End examination shall be 75 marks and 70 marks for II, III B.Sc., duration of the examination shall be 3 hours. Even though the candidate is absent for two IA exams /obtain Zero marks the external marks are considered (if the candidate gets 40/70) and the result shall be declared as "PASS".
- Semester – End examinations shall be conducted in theory papers at the end of every semester, while in practical papers, these examinations are conducted at the end of II,IV, & VI semesters **for I, II & III B.Sc**for 50 marks.
- Discussed and recommended for organizing **certificate course,seminars, Guest lecturers, workshops** to upgrade the knowledge of students, for the approval of the academic council.
- Discussed and empowered the Head of the department of Chemistry to suggest the panel of paper setters and examiners to the controller of examinations.
- NIL.

K. Ramesh

Chairman

A.G & S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

Vuyyuru-521165

NAAC reaccredited at "A" level

Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: ORGANIC AND GENERAL CHEMISTRY **Semester: II**

Course Code	**CHET21A**	**Course Delivery Method**	**Class Room / Blended Mode**
Credits	**3**	CIA Marks	25
No. of Lecture Hours / Week	**4**	Semester End Exam Marks	**75**
Total Number of Lecture Hours	**60**	Total Marks	**100**
Year of Introduction : 2021-22	Year of Offering: 2021 - 22	Year of Revision: ----------	Percentage of Revision: 0

Course outcomes:

At the end of the course, the student will be able to;

CO1. Understand and explain the differential behaviour of organic compounds based on fundamental concepts learnt.

CO2. Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.

CO3. Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.

CO4. Understand the concepts of absorption and adsorption, colloidal chemistry and nature of Chemical Bonding.

CO5. Correlate and describe the stereo chemical properties of organic compounds and reactions.

Learning Objectives:

1. To understand the basic concepts of alkanes & cycloalkanes.
2. To identify the difference between saturated and unsaturated hydrocarbons.
3. To learn the basic concepts of aromatic compounds and its reactivity.
4. To understand the chemistry of adsorption, colloid chemistry, HSAB principle and Molecular Orbital theory.
5. To learn the fundamental aspects of stereo chemistry.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
	ORGANIC CHEMISTRY	
I	**Recapitulation of Basics of Organic Chemistry** **Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes)** **1.1**General methods of preparation of alkanes- Wurtz and Wurtz - Fittig reaction, Corey House synthesis, physical and chemical properties of alkanes, Isomerism and its effect on properties. **1.2** Free radical substitutions; Halogenation, concept of relative reactivity v/s selectivity. **1.3** Conformational analysis of alkanes (Conformations, relative stability and energy diagrams of Ethane, Propane and butane). **1.4** General molecular formulae of cycloalkanes and relative stability, Baeyer strain theory, Cyclohexane conformations with energy diagram,Conformations of mono substituted cyclohexane.	**12h**
II	**Carbon-Carbon pi Bonds (Alkenes and Alkynes)** **2.1** General methods of preparation, physical and chemical properties. **2.2** Mechanism of E1,E2,E1CB reactions, Saytzeff and Hoffmann eliminations, Electrophilic Additions, mechanism(Markownikoff / Antimarkownikoff addition) with suitable examples, *syn* and *anti*-addition; addition of H_2,X_2, HX. oxymercuration-9, demercuration, hydroboration-oxidation, ozonolysis, Hydroxylation , Diels alder reaction , 1,2 and 1,4 addition reaction in Conjugated Dienes. **2.3** Reactions of alkynes; acidity, electrophilic and	**12h**

	nucleophilic additions, hydration to form carbonyl compounds, Alkylation of terminal alkynes.	
III	**Benzene and its reactivity** **3.1** Concept of aromaticity, Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non - Benzenoid compounds (cyclopropenylcation, cyclopentadienyl anion and tropyliumcation) **3.2** Reactions - General mechanism of electrophilic aromatic substitution, mechanism of nitration, Friedel-Craft's alkylation and acylation. **3.3** Orientation of aromatic substitution - 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)	12h
	GENERAL CHEMISTRY	
IV	**Surface chemistry and chemical bonding** **1. Surface chemistry** **4.1 Colloids-** Coagulation of colloids- Hardy-Schulze rule. Stability of colloids, Protection of Colloids, Gold number. **4.2 Adsorption-**Physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption. **2. Chemical Bonding** **4.3** Valence bond theory, hybridization, VB theory as applied to ClF_3**,** $Ni(CO)_4$	14h

	4.4 Molecular orbital theory -LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N2, O2, CO and NO). **3. HSAB** **4.5** Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.	
V	**Stereochemistry of carbon compounds** **5.**1 Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae. **5.2** Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation. **5.3** 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. **5.4** D, L, R,S and E,Z- configuration with examples. Definition of Racemic mixture – Resolution of racemic mixtures (any 3 techniques)	10h

Co-curricular activities and Assessment Methods

Continuous Evaluation: Monitoring the progress of student's learning

Class Tests, Worksheets and Quizzes

Presentations, Projects and Assignments and Group Discussions: Enhances critical thinking skills and personality

Semester-end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.

List of Text Books

1. A Text book of Organic Chemistry by Lloyd.N.Ferguson
2. A Text book of Organic Chemistry by Rakesh K.Parashar & V.K.Ahluwalia
3. Telugu Academy Book
4. Unified Chemistry by O.P.Agarwal-Vol-I

List of Reference Books

Theory:

1. Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (PearsonEducation).
2. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
4. Eliel, E. L. &Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994.
5. Kalsi, P. S. Stereochemistry Conformation and Mechanism; New Age International, 2005.

Practical:

1. Ahluwalia, V.K. &Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
2. Ahluwalia, V.K. &Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
3. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)

Additional Resources:

1. Solomons, T. W. G.; Fryhle, C. B. &Snyder, S. A. Organic Chemistry, 12th Edition, Wiley.

   Bruice, P. Y. Organic Chemistry, Eighth Edition, Pearson.
2. Clayden, J.; Greeves, N.&Warren, S. Organic Chemistry, Oxford.
3. Nasipuri, D. Stereochemistry of Organic Compounds: Principles and Applications, Third Edition, NewAge International.
4. Gunstone, F. D. Guidebook to Stereochemistry, Prentice Hall Press, 1975.

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE (AUTONOMOUS), VUYYURU.

SEMESTER – II PAPER-II	PAPER CODE : CHET21A
PAPER TITLE: ORGANIC & GENERAL CHEMISTRY -I ACADEMIC YEAR-2021-2022	

Time: 3 Hours **Max. Marks: 75M**

PART- A 5 X 5 = 25 Marks

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

1. Write different conformations of n-butane. Explain their relative stability. **L2- CO1**
2. Explain 1, 2- & 1,4- addition reactions of conjugated dienes. **L2- CO2**
3. Explain the orientation effect of halogens on mono substituted benzene. **L2- CO3**
4. Explain the mechanism of E_1CB elimination reaction. **L2- CO2**
5. Explain the structure of ClF_3 by Valency Bond theory. **L2- CO4**
6. What are Hard & soft acids & bases? Explain with examples. **L1- CO4**
7. Draw the Wedge, Fischer, Newmann & saw-Horse representations for Tartaric acid. **L1- CO5**
8. Define Enantiomers and Diastereomers and give two examples for each. **L2- CO5**

PART- B 5 X 10 = 50 Marks

Answer **ALL** the questions. Each carries **TEN** marks

9. (a) (i)Write the preparation of alkanes by Wurtz and Corey-House reaction.
   (ii) Explain Halogenation of alkanes. Explain the reactivity and selectivity in free radical substitutions. **L2- CO1**

   (or)

   (b).(i) Explain Baeyer Strain Theory
   (ii) Draw the conformations of Cyclohexane and explain their stability by drawing energy profile diagram. **L2- CO1**

10. (a).(i) Write any two methods of preparation of alkenes.
    (ii) Explain the mechanism of Markownikoff and Anti-Markownikoff addition of HBr to alkene. **L2- CO2**

    (or)

    (b) (i) Explain the acidity of 1-alkynes
    (ii) How will you prepare acetaldehyde and acetone from alkynes?
    (iii) Write alkylation reaction of terminal alkyne. **L1- CO2**

11. (a) Define Huckel rule of aromatic compounds. What are Benzenoid and non-Benzenoid aromatic compounds? Give examples. **L1- CO3**

(or)

(b) Explain the mechanisms of Nitration and Friedel-Craft's alkylation of Benzene.**L2- CO3**

12. (a) (i) Define Hardy-Schulze rule & Gold number.

(ii)Differentiate Physisorption& Chemisorption. Explain Langmuir adsorption isotherm.

L2- CO4

(or)

(b) Construct the Molecular Orbital diagram for O2 and NO and explain their bond order and magnetic property. **L2- CO4**

13. (a) Define racemic mixture. Explain any two techniques for resolution of racemic mixture. **L2- CO5**

(or)

(b) (i) Define Optical activity and Specific rotation.
(ii) Draw the R- & S- isomers of Alanine, Glyceraldehyde.
(iii) Write the E- & Z- isomers of 2-butene. **L1- CO5**

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PRACTICAL SYLLABUS.

Practical Paper – II **Volumetric Analysis**	**PAPER CODE : CHEP21A** **ACADEMIC YEAR-2021-2022**

30 hrs (2h/w) **Credits-2**

Course outcomes:

At the end of the course, the student will be able to;

1. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
2. Understand and explain the volumetric analysis based on fundamental concepts learnt in ionic Equilibria
3. Learn and identify the concepts of standard solutions, primary and secondary standards
4. Facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

Volumetric analysis 50 M

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
2. Determination of Fe (II) using KMnO4 with oxalic acid as primary standard.
3. Determination of Cu (II) using $Na_2S_2O_3$ with K2Cr_2O_7 as primary standard
4. Estimation of water of crystallization in Mohr's salt by titrating with KMnO4

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Title of the Paper: INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY

Semester: IV

Course Code	**CHE-401C**	**Course Delivery Method**	**Class Room / Blended Mode**
Credits	**3**	CIA Marks	30
No. of Lecture Hours / Week	**4**	Semester End Exam Marks	**70**
Total Number of Lecture Hours	**60**	Total Marks	**100**
Year of Introduction : 2021 - 22	Year of Offering: 2021 - 22	Year of Revision: ----------	Percentage of Revision: 0

Program outcomes:

Main objectives of this paper is to give a basics, applications and updated knowledge for the students on Chemistry of Organometallic Compounds, Carbohydrates Amino acids and proteins, Nitrogen Containing Functional Groups, Photochemistry and Thermodynamics.

Course Outcomes:

At the end of the course, the student will be able to:

1. To learn about the laws of absorption of light energy by molecules and the subsequent photochemical reactions.
2. To understand the concept of quantum efficiency and mechanisms of photochemical reactions

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
	INORGANIC CHEMISTRY	
I	**Organometallic Compounds (Marks weightage 10+5)** Definition and classification of organometallic Compounds on the basis of bond type, Concept of hapticity of organic ligands. Metal carbonyls: 18electronrule, electron count of mononuclear, poly nuclear and substituted metal carbonyls of Fe, Ni, Co.	**8h**
	ORGANIC CHEMISTRY	
II	**Carbohydrates (Marks weightage 10)** Occurrence, classification, Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; **Interconversions (Marks weightage 5)** 1. Aldopentose to Aldohexose (Killiani-Fischer synthesis) 2. Aldohexose to Aldopentose (Ruff degradation). 3. Aldohexose to ketohexose 4. Ketohexose to Aldohexose	**8h**
III	**1. Amino acids and proteins (Marks weightage 10)** **6h** Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, valine and leucine) by following methods: a) from halogenated carboxylic acid b) from malonic ester synthesis c) strecker's synthesis.	**6h**

	Physical properties: **(Marks weightage 5)** Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point. Chemical properties: **(Marks weightage 5)** General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating- peptide bond (amide linkage). Structure and nomenclature of peptides and proteins. **2. Heterocyclic Compounds (Marks weightage 10)** Introduction and definition: Simple five membered ring compounds with one hetero atom Ex. Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1, 4, -dicarbonyl compounds, Paul-Knorr synthesis. Properties: Acidic character of pyrrole - electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan. **Pyridine (Marks weightage 5)** Pyridine – Structure - Basicity - Aromaticity- Comparison with pyrrole- one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction	**7h**
IV	**Nitrogen Containing Functional Groups** Preparation, properties and important reactions of nitro compounds, amines and diazonium salts. **1. Nitrohydrocarbons** **3h** Nomenclature and classification-nitro hydrocarbons, structure - Tautomerism of nitroalkanes leading to aci and keto form, Preparation of Nitroalkanes, reactivity -halogenation, reaction with HONO (Nitrous acid), **Reactions (Marks weightage 10)** Nef reaction and Mannich reaction leading to Micheal addition	**3h**

	and reduction. **2. Amines (Marks weightage 10 +5)** Introduction, classification, chirality in amines (pyramidal inversion), importance and general methods of preparation. **Properties :** Physical properties, Basicity of amines: Effect of substituent, solvent and steric effects. Distinction between Primary, Secondary and tertiary amines using nitrous acid. Discussion of the following reactions; (Not required mechanism) Gabriel Phthalimide synthesis, Hoffmann-Bromamide reaction, Carbylamine reaction. **Diazonium Salts**: Synthetic applications of diazonium salts including preparation of arenes, haloarenes, Coupling reactions of diazonium salts (preparation of azo dyes).	**11h**
V	**1.Photochemistry (Marks weightage 10+5)** Difference between thermal and photochemical processes, Laws of photochemistry- Grothus- Draper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield- Photochemical reaction mechanism- hydrogen- chlorine and hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence, Jablonski diagram, Photosensitized reactions- energy transfer processes (simple example). **2. Thermodynamics (Marks weightage 10+5)** The first law of thermodynamics-statement, definition of internal energy and enthalpy, Heat capacities and their relationship, Joule-Thomson effect- coefficient, Calculation of work for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes, State function. Temperature dependence of enthalpy of formation- Kirchoff s equation, Second law of thermodynamics Different Statements of the law,	**5h**

	Carnot cycle and its efficiency, Carnot theorem, Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes.	**12h**

List of Reference Books

1. Concise coordination chemistry by Gopalan and Ramalingam
2. Coordination Chemistry by Basalo and Johnson
3. Organic Chemistry by G.Mareloudan, Purdue Univ
4. Text book of physical chemistry by S Glasstone
5. Concise Inorganic Chemistry by J.D.Lee
6. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
7. A Text Book of Organic Chemistry by Bahl and Arunbahl
8. A Text Book of Organic chemistry by I L FinarVol I
9. A Text Book of Organic chemistry by I L FinarVol II
10. Advanced physical chemistry by Gurudeep Raj

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SEMESTER – IV PAPER- IV	PAPER CODE : CHE-401C
PAPER TITLE: INORGANIC, ORGANIC & PHYSICAL CHEMISTRY **ACADEMIC YEAR-2021-2022**	

Time: 3 hours Maximum Marks: 70

PART- A 4 X 5 = 20 Marks

Answer any **FOUR** of the following questions. Each carries **FIVE** marks

1. Describe the 18 electron rule of mono nuclear and polynuclear metal carbonyls with suitable examples.
2. What are epimers and anomers. Give examples.
3. Discuss about isoelectric point.
4. Write the reactions due to amino group.
5. Discuss the structure of pyridine.
6. Discuss the basic nature of amines.
7. Write the differences between thermal and photochemical reactions.
8. Derive heat capacities and derive Cp – Cv = R**.**

PART- B

Answer any FIVE questions. Each question carries 10 marks. **5X10=50M**

9. What are organometallic compounds? Discuss their Classification on the basis of type of bonds with examples.
10. Discuss the structure illustration of fructose.
11. What are amino acids? Write any two general methods of preparation of amino acids.
12. Discuss the aromatic character of Furan, Thiophene and Pyrrole.
13. Write the mechanism for the following. (i). Nef reaction (ii) Mannich reaction
14. Discuss any three synthetic applications of diazonium salts
15. Explain about jablonski diagram.
16. Define entropy. Describe entropy changes in the reversible and irreversible process.

The Guidelines to be followed by the question paper setters in chemistry for the

IV- Semester - end exams

SEMESTER – IV SUBJECT: CHEMISTRY COURSE CODE: CHE-401C
PAPER TITLE : INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY
ACADEMIC YEAR-2021-2022

Weightage for the question paper

syllabus	Section-A (Short answer questions)	Section-B (essay questions)
Unit-1 (15 Marks)	1	1
Unit-2 (15 Marks)	1	1
Unit-3 (35 Marks)	1+1+1	1+1
Unit-4 (25 Marks)	1	1+1
Unit- 5 (30 Marks)	1+1	1+1

- Each Short answer question carries 5 marks in Section –A
- Each Essay question carries 10 marks in Section –B

The Question papers setters are requested to cover all the topics in the syllabus stipulated as per the weightage given by us.

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PRACTICAL SYLLABUS.

Practical Paper – IV **Organic Qualitative analysis**	**PAPER CODE : CHE-401 P** **ACADEMIC YEAR-2021-2022**

30 hrs (2h/w) **Credits-2**

Course outcomes:

At the end of the course, the student will be able to;

1. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory.
2. Determine melting and boiling points of organic compounds
3. Understand the application of concepts of different organic reactions studied in theory part of organic chemistry.

Organic Qualitative analysis **50 M**

Analysis of an organic compound through systematic qualitative procedure for functional group identification including the determination of melting point and boiling point with suitable derivatives.

Alcohols, Phenols, Aldehydes, Ketones, Carboxylic acids, Aromatic primary amines, amides and simple sugars.

SCHEME OF VALUATION

1. INTERNAL MARKS- Record-10M
2. EXTERNAL MAKS-40
    - Analysis of an organic compound and preparation of suitable derivative-30M
    - Viva questions = 10 M

      TOTAL = 50 M_

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Title of the Paper: INORGANIC & PHYSICAL CHEMISTRY

Semester: IV

Course Code	**CHE-402C**	**Course Delivery Method**	**Class Room / Blended Mode**
Credits	**3**	CIA Marks	30
No. of Lecture Hours / Week	**4**	Semester End Exam Marks	**70**
Total Number of Lecture Hours	**60**	Total Marks	**100**
Year of Introduction : 2021 - 22	Year of Offering: 2021 - 22	Year of Revision: ----------	Percentage of Revision: 0

Program outcomes:

Main objectives of this paper is to give a basics, applications and updated knowledge for the students on Chemistry of Coordination Chemistry, Inorganic Reaction Mechanism Stability of metal complexes, Bioinorganic Chemistry, Phase rule, Chemical Kinetics and Electrochemistry.

Course outcomes:

At the end of the course, the student will be able to;

1. Understand concepts of boundary conditions and quantization, probability distribution, most probable values, uncertainty and expectation value
2. Application of quantization to spectroscopy.

3. Various types of spectra and their use in structure determination.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
	INORGANIC CHEMISTRY 26h	
I	**Coordination Chemistry (Marks weightage 10+10+5)** IUPAC nomenclature of coordination compounds, Structural and stereoisomerism in complexes with coordination numbers 4 and 6.Valence Bond Theory (VBT): Inner and outer orbital complexes. Limitations of VBT, Crystal field effect, octahedral symmetry. Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Tetrahedral symmetry, Factors affecting the magnitude of crystal field splitting energy, Spectro chemical series,	**12h**
II	**1. Inorganic Reaction Mechanism (Marks weightage 10+5)** **4h** Labile and inert complexes, ligand substitution reactions SN^1 and SN^2, Substitution reactions in square planar complexes, Trans-effect, theories of trans effect and its applications **2. Stability of metal complexes (Marks weightage 10+5)** 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. **3. Bioinorganic Chemistry (Marks weightage 5+5)** Metal ions present in biological systems, Importance of sodium, potassium and magnesium. Structure and functions of Hemoglobin.	**4h** **8h** **2h**
	PHYSICAL CHEMISTRY	**34h**
III	**1 .Phase rule (Marks weightage 10+5)** Concept of phase, components, degrees of freedom. Phase diagram of one component system - water system, Study of Phase diagrams of Simple eutectic systems i) Pb-Ag system, desilverisation of lead Definition and	**6h**

	examples for systems having congruent and incongruent melting point , freezing mixtures.	
IV	**Electrochemistry (Marks weightage 10+5)** Specific conductance, equivalent conductance and molar conductance- Definition and effect of dilution. Cell constant. Strong and weak electrolytes, Kohlrausch's law and its applications, Definition of transport number, determination of transport number by Hittorf's method. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only), Application of conductivity measurements- conductometric titrations. Electrochemical Cells- Single electrode potential, Types of electrodes with examples: Metal- metal ion, Gas electrode, Inert electrode, Redox electrode, Metal-metal insoluble salt- salt anion. Determination of EMF of a cell, Nernst equation, Applications of EMF measurements - Potentiometric titrations.	**14h**
V	**Chemical Kinetics: (Marks weightage 10+10+5)** The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction, Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half–life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation.	**14 h**

List of Reference Books

1. Text book of physical chemistry by S Glasstone
2. Concise Inorganic Chemistry by J.D.Lee
3. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
4. Advanced physical chemistry by Gurudeep Raj
5. Principles of physical chemistry by Prutton and Marron
6. Advanced physical chemistry by Bahl and Tuli
7. Inorganic Chemistry by J.E.Huheey
8. Basic Inorganic Chemistry by Cotton and Wilkinson
9. A textbook of qualitative inorganic analysis by A.I. Vogel
10. Atkins,P.W.&Paula,J.deAtkin'sPhysicalChemistryEd.,OxfordUniversityPress 10thEd(2014).
11. Castellan,G.W.Physical Chemistry 4thEd.Narosa(2004).
12. Mortimer,R. G.PhysicalChemistry 3rdEd. Elsevier:NOIDA,UP(2009).
13. Barrow,G.M.Physical Chemistry

The Guidelines to be followed by the question paper setters in chemistry for the

III- Semester - end exams

SEMESTER – IV SUBJECT: CHEMISTRY COURSE CODE: CHE-402C
PAPER TITLE : INORGANIC & PHYSICAL CHEMISTRY
ACADEMIC YEAR-2021-2022

Weightage for the question paper

syllabus	Section-A (Short answer questions)	Section-B (essay questions)
Unit-1 (25 Marks)	1	1+1
Unit-2 (40Marks)	1+1+1+1	1+1
Unit-3 (15Marks)	1	1
Unit-4 (15Marks)	1	1
Unit-5 (20Marks)	1	1+1

- Each Short answer question carries 5 marks in Section –A
- Each Essay question carries 10 marks in Section –B
- The Question papers setters are requested to cover all the topics in the syllabus stipulated as per the weightage given by us.

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SEMESTER – IV PAPER-V	PAPER CODE : CHE-402C
PAPER TITLE : INORGANIC & PHYSICAL CHEMISTRY	
ACADEMIC YEAR-2021-2022	

Time: 3 hours Maximum Marks: 70

PART- A 4X 5 = 20 Marks

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

1. Write note structural isomerism.
2. Explain Labile & inert complexes.
3. Explain mole ratio method for determination of composition of complex.
4. write structure and functions of Haemoglobin.
5. Write the importance of metals Na and K.
6. Write about freezing mixtures.
7. Explain about kohlrausch's law.
8. Explain order and molecularity.

PART- B

Answer any FIVE questions. Each question carries 10 marks. **5X10=50M**

9. Explain Valence Bond theory with Inner and Outer orbital complexes. Write limitations of VBT.
10. Define CFSE. Explain the factors affecting the magnitude of crystal field splitting energy.
11. Explain Trans effect. Explain the theories of trans effect and write any two applications of trans effect.
12. Write about factors affecting the stability of metal complexes.
13. Define Phase rule and terms involved in it. Explain phase diagram of Pb-Ag system.

14. Define Transport number. Write experimental method for the determination of transport number by Hittorf method.
15. Explain general methods for determination of order of a reaction.
16. Derive second order rate equation and half-life and units.

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PRACTICAL SYLLABUS

Practical Paper – V Conductometric and Potentiometric Titrimetry	**PAPER CODE : CHE-402P** **ACADEMIC YEAR-2021-2022**

30 hrs (2 h/W) **Credits: 2**

Practical-Course –V Conductometric and Potentiometric Titrimetry **50 M**

Course outcomes:

At the end of the course, the student will be able to;

1. Use glassware, equipment and chemicals and follow experimental procedures in the laboratory
2. Apply concepts of electrochemistry in experiments
3. Be familiar with electro analytical methods and techniques in analytical chemistry which study an analyte by measuring the potential (volts) and/or current (amperes) in an electrochemical cell containing the analyte

Conductometric and Potentiometric Titrimetry **50 M**

1. Conductometric titration- Determination of concentration of HCl solution using standard NaOH solution.
2. Conductometric titration- Determination of concentration of CH3COOH Solution using standard NaOH solution.
3. Conductometric titration- Determination of concentration of CH3COOH and HCl in a mixture using standard NaOH solution.
4. Potentiometric titration- Determination of Fe (II) using standard $K_2Cr_2O_7$ solution.

   Determination of rate constant for acid catalyzed ester hydrolysis

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Title of the Paper: ANALYTICAL METHODS IN CHEMISTRY

Semester: VI

Course Code	**CHE-601GE**	**Course Delivery Method**	**Class Room / Blended Mode**
Credits	**3**	CIA Marks	30
No. of Lecture Hours / Week	**4**	Semester End Exam Marks	**70**
Total Number of Lecture Hours	**60**	Total Marks	**100**
Year of Introduction : 2017-18	Year of Offering: 2021 - 22	Year of Revision: ----------	Percentage of Revision: 0

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Quantitative analysis: (Marks weightage 10+5)** Methods of different types of chemical analysis**,** Principle of volumetric analysis. Theories of acid-base, redox, complexometric, iodometric and precipitation titrations - choice of indicators for these titrations.	**15h**
II	**Treatment of analytical data**: (**Marks weightage** 10+5) Types of errors, significant figures and its importance, accuracy - methods of expressing accuracy, error analysis and minimization of errors, precision - methods of expressing precision, standard deviation and confidence limit.	**8h**
III	**Separation Techniques in Chemical analysis (Marks weightage 10+10+5)** **Solvent extraction**: Introduction, principle, techniques, factors affecting solvent Extraction, Batch extraction, continuous extraction. Synergism. Application - Determination of Iron (III), organic mixture analysis.	**15h**
IV	**Chromatography (Marks weightage 10+10+5+5)** Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, Rf values, factors effecting Rf values. **Ion exchange Chromatography**: Introduction, action of ion exchange resins, separation of inorganic mixtures, applications. **Paper Chromatography** : Principle, experimental procedures, choice of paper and solvent systems, developments of chromatogram - ascending, descending and radial.	**12h**

	Two dimensional chromatography, applications.	
V	**Thin layer Chromatography (TLC**): **(Marks weightage 10+10+5+5)** Principles, Experimental procedures. Adsorbents and solvents. Preparation of plates. Development of the chromatogram. Detection of the spots. Applications. **Column Chromatography**: Principles, experimental procedures, Stationary and mobile Phases, Separation technique. Applications. **GC**: Principle and applications, **HPLC**: Basic principle and applications.	**10h**

List of Reference Books

1. Analytical Chemistry by Skoog and Miller
2. A textbook of qualitative inorganic analysis by A.I. Vogel
3. Nanochemistry by Geoffrey Ozin and Andre Arsenault
4. Stereochemistry by D. Nasipuri
5. Organic Chemistry by Clayden

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Model question paper

SEMESTER – VI	PAPER CODE : CHE-601GE
PAPER TITLE : ANALYTICAL METHODS IN CHEMISTRY, PAPER-VII, Model question paper- AC-2021-22	

Time: 3Hours **Maximum marks: 70** **Pass marks: 28**

SECTION-A

Answer any FOUR of the following. Each question carries 5 marks. 4X5=20M

1. Explain the principals involved in chemical analysis
2. Define precession write the methods of expressive precession.
3. Write the applications of Solvent extraction.
4. Write the Principle of differential migration of adsorption phenomenon.
5. Write a short note on Nature of adsorbent
6. Write the Principles of TLC and give their applications.
7. Write the development methods of chromatograms.

SECTION-B

Answer any FIVE questions. Each question carries 10 marks. 5X10=50M

8. Explain about (a)Complexometric titrations (b) Idometric titrations
9. Explain the Choice of indicators for Acid -base and Redox titrations.
10. Define and explain the methods of expressing Accuracy.
11. Discuss the principle, factors affecting the solvent extraction and write the applications of solvent extraction.
12. Discuss the Separation of in organic mixtures by using ion exchange method.
13. Explain the classification of Chromatographic methods.
14. How to prepare plates in TLC.
15. Explain principle and applications of HPLC.

The Guidelines to be followed by the question paper setters in chemistry for the VI- Semester - end exams –Academic year -2021-22

SEMESTER – VI	**PAPER CODE : CHE-601GE**
PAPER TITLE : ANALYTICAL METHODS IN CHEMISTRY, PAPER-VII	

syllabus	Section-A (Short answer questions)	Section-B (Essay questions)
Unit-1 (15 Marks)	1	1
Unit-2 (15 Marks)	1	1
Unit-3 (25 Marks)	1	1+1
Unit-4 (30 Marks)	1+1	1+1
Unit-5 (30 Marks)	1 +1	1 + 1

- Each Short answer question carries 5 marks in Section –A
- Each Essay question carries 10 marks in Section –B
- The Question papers setters are requested to cover all the topics in the syllabus stipulated as per the weightage given by us.

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PRACTICAL SYLLABUS

Practical Paper – I	**PAPER CODE : CHE-601GE**
Analysis of SALTMIXTURE	**ACADEMIC YEAR-2021-2022**

1. Identification of amino acids by paper chromatography.
2. Determination of Zn using EDTA
3. Determination of Mg using EDTA
4. Hardness of water.

SCHEME OF VALUATION

1. INTERNAL MARKS- Record-10M
2. EXTERNAL MAKS-40
    - Titrimetric analysis -30
    - Viva-10

TOTAL = 50 M

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Title of the Paper: ORGANIC SPECTROSCOPIC TECHNIQUES

Semester: VI

Course Code	**CHE-602CE**	**Course Delivery Method**	**Class Room / Blended Mode**
Credits	**3**	CIA Marks	30
No. of Lecture Hours / Week	**4**	Semester End Exam Marks	**70**
Total Number of Lecture Hours	**60**	Total Marks	**100**
Year of Introduction : 2017-18	Year of Offering: 2021 – 22	Year of Revision: ----------	Percentage of Revision: 0

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY** **(Marks weightage 10+10+5)** Nuclear spin, Principles of NMR-Classical and Quantum Mechanical methods, Larmour Frequency. Instrumentation. Saturation, Relaxation spin-spin & spin lattice relaxation. Chemical shifts -Factors influencing Chemical shift, Shielding and De-shielding mechanism.	**15h**
II	**NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY** **(Marks weightage 10+5)** Spin-Spin interactions-factors affecting spin-spin interactions, Deuterium exchange (H^+) Coupling constant- types of coupling constant-vicinal, Geminal and long range coupling constant-Factors influencing coupling constants. Types of PMR Spectrums –AX, AX_2 and AB type with one example.	**8h**
III	**Electron Spin Resonance Spectroscopy** **(Marks weightage 10+10+5+5)** Basic Principles, Theory of ESR, Comparison of NMR & ESR.Instrumentation, Factors affecting the 'g' value, determination of 'g' value. Isotropic and Anisotropic constants. Splitting hyper fine splitting coupling constants. Line width, Zero field splitting and Kramer degeneracy. Crystal field splitting,Crystal field effects.Applications:- Detection of free radicals, ESR spectra of (a) H^- radical (b)Deuterium radical (c) Methyl radical(CH_3) (d) Benzene anion (C_6H_6) (e) $[Cu(H_2O)_6]^{+2}$	**14h**
IV	**UV & VISIBLE SPECTROSCOPY**	

	(Marks weightage 10+10+5+5) Electronic spectra of diatomic molecules. The Born- oppenheimer approximation. Vibration coarse structure: Intensity of Vibrational-electronic spectra: The Franck-Condon principle.Electronic structure of diatomic molecules. Types of transitions, Chromophores, Auxochrome, types of shifts in UV Visible spectrum, Conjugated dienes, trienes and polyenes, unsaturated carbonyl compounds-Woodward – Fieser rules.	**15h**
V	**Electronic spectra of polyatomic molecules** **(Marks weightage 10+5)** Chemical analysis by Electronic Spectroscopy – Beer-Lambert's Law. Deviation from Beer's law. Quantitative determination of metal ions (Mn^{+2}, Fe^{+2}). Simultaneous determination of Chromium and Manganese in a mixture.	**8h**

REFERENCE BOOKS:

1. Electron Spin Resonance Elementary Theory and Practical Applications- John E. Wertz and James R. Bolton, Chapman and Hall, 1986.
2. Spectroscopic Identification of organic compounds – Silverstein, Basseler and Morril.
3. Organic Spectroscopy- William Kemp.
4. Fundamentals of Molecular Spectroscopy- C.N.Banwell and E.A. Mc cash 4_{th}Edition, Tata Mc GrawHillPublishing Co., Ltd. 1994.
5. Physical Methods in Inorganic Chemistry – R.S.Drago, Saunders Publications.
6. Application of MÖssbauer Spectroscopy – Green Mood.
7. NMR, NQR, EPR and MÖssbauer Spectroscopy in inorganic chemistry – R.VParish, Ellis, Harwood.

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Model question paper

SEMESTER – VI	PAPER CODE : CHE-602CE
PAPER TITLE : : ORGANIC SPECTROSCOPIC TECHNIQUES, PAPER-VIII, Model question paper- AC-2021-22	

Time: 3Hours **Maximum marks: 70** **Pass marks: 28**

Answer any FOUR of the following. Each question carries 5 marks. 4X5=20M

1. Write about Nuclear spin?
2. Write any two types of coupling costant?
3. Write about Kramer degeneracy?
4. What is isotropic and anisotropic costants?
5. Explain Woodward-Fieser rules?
6. Write a short note on Auxochrome?
7. Define and derive Beer-Lambert's law.

SECTION-B

Answer any FIVE questions. Each question carries 10 marks. **5X10=50M**

8. Explain the instrumentation of the NMR?
9. Explain Spin-Spin relaxation and spin lattice relaxation.
10. Write the types of PMR spectrums of AX, AX2 & AB?
11. Explain the instrumentation of the ESR.
12. Explain the ESR splitting of a) Deuterium radical b) $[Cu(H_2O)_6]^{+2}$ ion
13. Explain the electronic spectra of di atomic molecule.
14. Write note on Vibrational coarse structure.
15. Explain the simultaneous determination of Chromium and Manganese in a mixture.

The Guidelines to be followed by the question paper setters in chemistry for the VI-Semester - end exams Academic year- 2021-22

PAPER TITLE: ORGANIC SPECTROSCOPIC TECHNIQUES,
PAPER CODE: CHE-602CE

Paper – VIII **Maximum marks : 70** **Duration : 3 Hours**

Weightage for the question paper

syllabus	Section-A (Short answer questions)	Section-B (essay questions)
Unit-1 (25Marks)	1	1+1
Unit-2 (15 Marks)	1	1
Unit-3 (30Marks)	1+1	1+1
Unit-4 (30Marks)	1+1	1+1
Unit-5 (15Marks)	1	1

- Each Short answer question carries 5 marks in Section –A
- Each Essay question carries 10 marks in Section –B
- The Question papers setters are requested to cover all the topics in the syllabus stipulated as per the weightage given by us.

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Title of the Paper: ADVANCED ORGANIC REACTIONS

Semester: VI

Course Code	**CHE-603CE**	**Course Delivery Method**	**Class Room / Blended Mode**
Credits	**3**	CIA Marks	30
No. of Lecture Hours / Week	**4**	Semester End Exam Marks	**70**
Total Number of Lecture Hours	**60**	Total Marks	**100**
Year of Introduction : 2017-18	Year of Offering: 2021 – 22	Year of Revision: ----------	Percentage of Revision: 0

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**ORGANIC PHOTO CHEMISTRY** **(Marks weightage 10+10+5)** Organic photochemistry: Molecular orbitals, carbonyl chromophore–Jablonski diagram, Photochemical reactions- Photo reduction-mechanism, example-aromatic compounds. Sensitizer and influence of sensitizer.	**10h**
II	**ORGANIC PHOTOCHEMISTRY** **(Marks weightage 10+10+5)** Norrisch cleavages, type -I: Mechanism, acyclic cyclic diones, Photo Fries rearrangement. Norrisch type II cleavage: Mechanism and stereochemistry, Type- II reactions of esters: 1: 2 diketones, photo decarboxylation, Di-π methane Rearrangement, Photochemistry – of conjugated dienes, Decomposition of nitrites –Barton reaction.	**12h**
III	**PROTECTING GROUPS AND ORGANIC REACTIONS** **(Marks weightage 10+10+5+5)** Principles of (1) Protection of alcohols – ether formation including silyl ethers – ester formation, (2) Protection of diols – acetal,ketal and carbonate formation, (3) Protection of carboxylic acids – ester formation, benzyl and t–butyl esters, (4) Protection of amines– acetylation, benzoylation, benzyloxy carbonyl, triphenyl methyl groups and fmoc, (5)Protection of carbonyl groups – acetal, ketal, 1,2–glycols and 1,2–dithioglycols formation.	**15h**
IV	**SYNTHETIC REACTIONS**: **(Marks weightage 10+5+5)** Mannich reaction – Mannich bases – Robinson annulations. The Shapiro reaction, Stork–enamine reaction. Use of dithioacetals – Umpolung, phase transfercatalysis – mechanisms and use of	**8h**

	benzyl trialkyl ammonium halides. Witting reaction.	
V	**NEW SYNTHETIC REACTIONS (Marks weightage 10+5)** **Define with example and mechanism-** Suziki coupling, Click reaction,Baylis–Hillman reaction,RCM olefm metathesis, Mukayama aldol reaction. **Define with one example**: (Mechanism not required**)** Mitsunobu reaction, McMurrey reaction, Julia–Lythgoe olefination, Stille coupling and Heck reaction.	**15h**

Recommended Books

1. Molecular reactions and Photochemistry by Charles Dupey and O.L. Chapman.
2. Molecular Photochemistry by Turru.
3. Importance of antibonding orbitals by Jaffe and Orchin.
4. Text Book of Organic Chemistry by Cram,. Hammand and Henrickson.
5. Some modern methods of organic synthesis by W. Carruthers.
6. Guide Book to Organic Synthesis by R.K. Meckie, D.M. Smith and R.A. Atken.
7. Organic Synthesis by O.House.
8. Organic synthesis by Michael B. Smith.

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Model question paper

SEMESTER – VI	PAPER CODE : CHE-603CE
PAPER TITLE : ORGANIC SPECTROSCOPIC TECHNIQUES, PAPER-IX, Model question paper- AC-2021-22	

Time: 3Hours **Maximum marks: 70** **Pass marks: 28**

SECTION-A

Answer any FOUR of the following. Each question carries 5 marks. **4X5=20M**

1. Write about Chromophore triplet state?
2. Write about Barton reaction?
3. Explain how to protect the Carbonyl group?
4. Explain how to protect the Diols?
5. Explain about Umpolung?
6. Explain PTC with mechanism?
7. Explain Suziki coupling?

SECTION-B

Answer any FIVE questions. Each question carries 10 marks. **5X10=50M**

8. Explain about Jablonski diagram in organic photo chemistry?
9. Explain mechanism of photo reduction with examples?
10. Explain Norrissch type –I cleavage with mechanism?
11. Explain Norrissch type –II cleavage with mechanism?
12. Explain how to protect Alcohols?
13. Explain how to protect Carboxylic acids?
14. What is Mannich reaction? Explain with mechanism and Mannich bases?
15. Write the mechanism of Baylis-Hillman reaction and RCM Olefination?

The Guidelines to be followed by the question paper setters in chemistry for the VI-Semester - end exams Academic year- 2021-22

PAPER TITLE: ADVANCED ORGANIC REACTIONS, PAPER CODE: CHE-603CE

Paper – VIII **Maximum marks : 70** **Duration : 3 Hours**

Weightage for the question paper

syllabus	Section-A (Short answer questions)	Section-B (essay questions)
Unit-1 (25Marks)	1	1+1
Unit-2 (25 Marks)	1	1+1
Unit-3 (30 Marks)	1+1	1+1
Unit-4 (20Marks)	1+1	1
Unit-5 (15 Marks)	1	1

- Each Short answer question carries 5 marks in Section –A
- Each Essay question carries 10 marks in Section –B
- The Question papers setters are requested to cover all the topics in the syllabus stipulated as per the weightage given by us.

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Title of the Paper: PHARMACEUTICAL AND MEDICINAL CHEMISTRY

Semester: VI

Course Code	**CHE-604CE**	**Course Delivery Method**	**Class Room / Blended Mode**
Credits	**3**	CIA Marks	30
No. of Lecture Hours / Week	**4**	Semester End Exam Marks	**70**
Total Number of Lecture Hours	**60**	Total Marks	**100**
Year of Introduction : 2017-18	Year of Offering: 2021 - 22	Year of Revision: ----------	Percentage of Revision: 0

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Pharmaceutical chemistry Terminology:** **(Marks weightage 10+5+5)** Pharmacy, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics (ADME, Receptors - brief treartment) Metabolites and Anti metabolites.	**12h**
II	**Drugs (Marks weightage 10+10+5)** Nomenclature: Chemical name, Generic name and trade names with 10-examples Classification based on structures and therapeutic activity with one example each.	**10h**
III	**Synthesis and therapeutic activity of the compounds:** **Chemotheraputic Drugs (Marks weightage 10+10+5)** l.Sulphadrugs(Sulphamethoxazole) 2.Antibiotics - β-Lactam Antibiotics-Isolation of Pencilline by submerged culture method, 3. Anti malarial Drugs (chloroquine). **Psycho therapeutic Drugs**: **(Marks weightage 10+5)** 1.Antipyretics(Paracetamol)2.Hypnotics,Tranquilizers (Diazepam) 3.Levodopa.	**18h**
IV	**Pharmacodynamic Drugs: (Marks weightage 10+5)** 1.Antiasthma Drugs (Solbutamol) 2. Antianginals (Glycerol Trinitrate) 3.Diuretics (Frusemide)	**8h**
V	**HIV-AIDS: (Marks weightage 10+5)** Immunity - CD-4cells, CD-8cells, Retro virus, Replication in human body, Investigation available, prevention of AIDS, Drugs available - examples with structures: PIS: Indivanir (crixivan), Nelfinavir(Viracept).	**12h**

List of Reference Books:

1. Medicinal Chemistry by Dr. B.V.Ramana
2. Synthetic Drugs by O.D.Tyagi & M.Yadav
3. Medicinal Chemistry by Ashutoshkar
4. Medicinal Chemistry by P.Parimoo
5. Pharmacology& Pharmacotherapeutics R.S Satoshkar & S.D.Bhandenkar

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Model question paper

SEMESTER – VI	PAPER CODE : CHE-604CE
PAPER TITLE : PHARMACEUTICAL AND MEDICINAL CHEMISTRY, PAPER-IX, Model question paper- AC-2021-22	

Time: 3Hours **Maximum marks: 70** **Pass marks: 28**

SECTION-A

Answer any FOUR of the following. Each question carries 5 marks. 4X5=20M

1. What are Metabolites and anti metabolites? Explain with example.
2. Write a note on Pharmacology and Pharmacophore.
3. Explain the classification of drugs on the basis of structure.
4. Describe the synthesis and therapeutic activities of Sulphamethoxazole.
5. Write the synthesis,therapeutic activity and side effects of paracetamol.
6. Write a note on Antianginals.
7. Explain about immunity.

SECTION-B

Answer any FIVE questions. Each question carries 10 marks. 5X10=50M

8. What are Pharma cokinetics ? Describe Absorption,Distribution,Metabolism and Excretion(ADME)of drug.
9. Explain the classification of drugs based on therapeutic activity with examples.
10. Describe the nomenclature systems of drugs.
11. What are antibiotics? Give examples. Explain the isolation method of Pencillin by submerged culture method.
12. Write the synthesis, therapeutic activity and side effects of Chloroquine.
13. Discuss the synthesis and therapeutic activity of Levodopa.
14. Explain in detail about antiasthma drugs.
15. What is AIDS ?How it causes ? Write the drugs available for the treatment of AIDS with their structure?

The Guidelines to be followed by the question paper setters in chemistry for the VI-Semester - end exams Academic year-2021-22

PAPER TITLE: PHARMACEUTICAL AND MEDICINAL CHEMISTRY,

PAPER CODE: CHE-604CE

Paper – VIII-C-3 **Semester – VI** **Maximum marks : 70** **Duration : 3 Hours**

Weightage for the question paper

syllabus	Section-A (Short answer questions)	Section-B (essay questions)
Unit-1 (20 Marks)	1+1	1
Unit-2 (25Marks)	1	1+1
Unit-3 (40Marks)	1+1	1+1+1
Unit-4 (15 Marks)	1	1
Unit-5 (15Marks)	1	1

- Each Short answer question carries 5 marks in Section –A
- Each Essay question carries 10 marks in Section –B
- The Question papers setters are requested to cover all the topics in the syllabus stipulated as per the weightage given by us.

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PRACTICAL SYLLABUS

Practical Paper – I	**PAPER CODE : CHE-602CE**
Preparations of Organic compounds	**ACADEMIC YEAR-2021-2022**

30 hrs (2 h / W) **Credits-2**

1. Preparation of Aspirin.
2. Preparation of Paracetamol.
3. Preparation of Acetanilide
4. Preparation of Barbutiric Acid.
5. Preparation of Phenyl Azo β-naphthol.

SCHEME OF VALUATION

1. INTERNAL MARKS- Record-10M
2. EXTERNAL MAKS-40M
   - Titrimetric analysis -30
   - Viva-10

TOTAL = 50 M

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PRACTICAL SYLLABUS

Practical Paper – I **Preparations of Organic compounds by Green procedure**	**PAPER CODE : CHE-603CE** **ACADEMIC YEAR-2021-2022**

30 hrs (2h / W), **Credits-2**

1. Green procedure for organic qualitative analysis: Detection of N, S and halogens
2. Acetylation of 1^{o} amine by green method: Preparation of acetanilide
3. Rearrangement reaction in green conditions: Benzil-Benzilic acid rearrangement
4. Electrophilic aromatic substitution reaction: Nitration of phenol
5. Radical coupling reaction: Preparation of 1, 1-bis -2-naphthol
6. Green oxidation reaction: Synthesis of Adipic acid
7. Green procedure for Diels Alder reaction between furan and Maleic anhydride

SCHEME OF VALUATION

1. INTERNAL MARKS- Record-10M
2. EXTERNAL MAKS-40 M
   - Practical -30
   - Viva-10

TOTAL = 50 M_

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PRACTICAL SYLLABUS

Practical Paper – I	**PAPER CODE : CHE-604CE**
Project work	**ACADEMIC YEAR-2021-2022**

The students have chosen chemistry as cluster elective.

"*Spectral analysis of various shaded dried leaves powder extract with polar and non-polar solvents using IR and UV spectroscopies*" is selected as a project work to the students for this academic year.

SCHEME OF VALUATION

1. EXTERNAL- 25M- given by the Examiner (Viva)

2. INTERNAL = 25 M
   - Written viva-10 M
   - Submission of the project book-15M

TOTAL = 50 M_