

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

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

Accredited by NAAC with "A" Grade

2020-2021



DEPARTMENT OF CHEMISTRY

MINUTES OF BOARD OF STUDIES

EVEN SEMESTER

9-04-2021

Dept: copy - Even-2020-21

Minutes of the Online meeting of Board of studies in Chemistry for the Autonomous course of A.G. & S.G. Siddhartha Degree College of Arts & Science, Vuyyuru held at 9.30 am on 09-04-2021 in the Department of Chemistry.

Smt A.INDIRA Presiding

Members Present:

- 1) A. Indira Chairman
(Smt.A.Indira) HOD, Dept. of Chemistry,
A.G. & S.G.S.Degree College,Vuyyuru.
- 2) D.R. Reddy University Nominee
(Prof.D.Ramasekhar Reddy) Assistant Professor,
Dept. of Chemistry, Krishna University, MTM.
- 3) K.A. Emanuel B.O.S. Nominee
(Dr.K.A.Emanuel) Associate Professor in Chemistry,
Sir C.R.Reddy College,Eluru.
- 4) B.O.S. Nominee
(Dr.D.Bala karuna kumar) Associate Professor in Chemistry,
A.L.C College,Vijayawada.
- 5) Industrialist
(Dr.Nadella Taraka Ramarao) Manager, Q.C, Divis Laboratories Ltd,
Vizag.
- 6) Student Nominee
(Dr.V.Phani Kumar) Lecturer in Chemistry,
SRR&CVR Govt. Degree College, BZA.
- 7) K. Ramesh Member
(Sri.K.Ramesh) Lecturer in Chemistry,
A.G. & S.G.S.Degree College,Vuyyuru
- 8) M. Venkata Satya Member
(Smt.M.V.Santhi) Lecturer in Chemistry,
A.G. & S.G.S.Degree College,Vuyyuru.
- 9) G. Ramesh Member
(Sri.G.Ramesh) Lecturer in Chemistry,
A.G. & S.G.S.Degree College, Vuyyuru.
- 10) P. Suresh Member
(Sri.P.Suresh) Lecturer in Chemistry,
A.G. & S.G.S.Degree College,Vuyyuru.
- 11) M. Santhi Member
(Ms.M.Santhi) Lecturer in Chemistry,
A.G. & S.G.S.Degree College,Vuyyuru.
- 12) J. Nageswara Rao Member
(Sri.J.Nageswara Rao) 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 semesters of I Degree B.Sc., Chemistry for the Academic year 2020-2021.
2. To recommend the syllabus and model papers for IV semesters of II Degree B.Sc., Chemistry for the Academic year 2020-2021.
3. To recommend the syllabus and model papers for VI semesters of III Degree B.Sc. Chemistry for the Academic year 2020-21.
4. To recommend the Blue print of II, IV, & VI semesters of B.Sc. Chemistry for the Academic year 2020-21.
5. To recommend the Guidelines to be followed by the question paper setters in Chemistry for Semester – 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.


Chairman.

RESOLUTIONS

- 1) It is resolved to continue the **changed syllabus and modified model paper for II semesters of I B.Sc.** under Choice Based Credit System (CBCS) for the Academic year 2020-2021.
Adding Syllabus: Alkanes, Cyclo alkanes and alkenes.
- 2) It is resolved to implement the same syllabus **and model papers** under Choice Based Credit System (CBCS) for the Academic year 2020-21 for **IV semesters of II B.Sc.**
- 3) It is resolved to implement the same **syllabus and model papers** under Choice Based Credit System (CBCS) of 2020-21 for the Academic year 2019-20 for **VI semesters (General elective-A and cluster Elective-C) of III B.Sc.**
- 4) It is resolved to follow the **Blue prints** of II, semesters of Degree B.Sc. for the Academic year 2019-20. It is resolved to continue the same **Blue prints** of IV, and VI semesters of Degree B.Sc. for the Academic year 2020-21.
- 5) It is resolved to follow the same guidelines to be followed by the question paper setters for Chemistry II, semesters of Degree B.Sc. for the Academic Year 2018-19. III, IV, V and VI semesters of Degree B.Sc. for the Academic Year 2020-21.
- 6) It is resolved to continue the following teaching and evaluation methods for Academic year 2020-21.

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 IB.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 IB.Sc.**
- There is **no passing minimum** for internal assessment for I.B.Sc.
- Out of maximum 100 marks in each paper for II&III, 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)**. 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 assignment for II, &III B.Sc.**
- **Semester – End Examination:**
- The maximum mark for IB.Sc Semester – End examination shall be 70 marks and 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".
- The maximum marks for II & III B.Sc Semester – End examination shall be 75 marks and duration of the examination shall be 3 hours.
- 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 I, II, III, IV, V, VI semesters **for I, II &III B.Sc.**

- 7) Discussed and recommended for organizing **certificate course, seminars, Guest lecturers, workshops** to upgrade the knowledge of students, for the approval of the academic council.
- 8) Discussed and empowered the Head of the department of Chemistry to suggest the panel of paper setters and examiners to the controller of examinations.
- 9) NIL.


.....Chairman

Orientation of aromatic substitution –ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO₂ and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens (Explanation by taking minimum of one example from each type)

GENERAL CHEMISTRY

UNIT-IV

1. Surface Chemistry **Marks weightage -10+5+5** **8h**

Colloids: Characteristic of Colloids, Coagulation of Colloids, Hardy-Schulze law, Stability of colloids, protection of colloid, Gold number.

Adsorption: Physical and Chemical adsorption, Langmuir adsorption isotherms. Applications of adsorption.

2. Chemical Bonding **Marks weightage -10+5** **7h**

Valence bond theory, hybridization, VB theory as applied to ClF₃, Ni (CO)₄. Molecular orbital theory - LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N₂, O₂, CO and NO).

UNIT-V

Stereochemistry of Carbon compounds **Marks weightage -10+10+5** **15h**

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

List of Reference Books

1. Organic chemistry by Bahl & Arun Bahl
2. Organic chemistry by I L Finar Vol-I
3. Organic chemistry by Clayden
4. Surface & Colloid Chemistry by K.S.Birdi
5. Surface Chemistry by A Goel
6. Stereochemistry by P.S.Kalsi
7. Stereochemistry of Organic compounds by D. Nasipuri

SEMESTER – II	COURSE CODE : CHE- 201
PAPER TITLE : ORGANIC AND GENERAL CHEMISTRY, PAPER - II	

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 a note on selectivity and reactivity of halogenations of Alkanes.
2. Write E1, E2, E1 cb reactions with example.
3. Explain Orientation of amino group with one example?
4. Write general mechanism of electrophilic substitution of Benzene?
5. Write Coagulation of Colloids.
6. Write differences between physical and chemical adsorption.
7. Define and explain Bond order?
8. Explain about Specific rotation.

SECTION-B

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

9. Write physical and chemical properties of Alkanes?
10. Explain conformational analysis of Methyl cyclohexane
11. Write any three eletrophilic and nucleophilic reactions of Alkynes.
12. Write electronic interpretation of -NO₂ and -OH groups.
13. Explain characteristic of Colloids.
14. Define hybridization and explain the types of hybridizations with suitable examples.
15. Explain wave nature of light and plane polarized light.
16. Explain about optical isomerism of Tartaric acid?

The Guidelines to be followed by the question paper setters in Chemistry for the
II-Semester - end exams. **ACADEMIC YEAR-2020-21**

SEMESTER – II	PAPER CODE : CHE-201
PAPER TITLE : ORGANIC AND GENERAL CHEMISTRY, PAPER - II	

Weightage for the question paper

syllabus	Section-A (Short answer questions)	Section-B (Essay questions)
Unit-1 (25 Marks)	1	1+1
Unit-2 (15 Marks)	1	1
Unit-3 (20Marks)	1+1	1
Unit-4 (35 Marks)	1+1+1	1 + 1
Unit-5 (25 Marks)	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.

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE (AUTONOMOUS), VUYYURU.
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PRACTICAL SYLLABUS ACADEMIC YEAR-2020-21

Volumetric analysis	Paper code : CHE-201
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30 hrs (2 h /w) Credits: 2

- 1. Estimation of carbonate ion and bicarbonate ion present in a mixture.**
- 2. Determination of Fe (II) using KMnO_4 with Oxalic acid as primary standard.**
- 3. Determination of Cu (II) using Hypo solution with $\text{K}_2\text{Cr}_2\text{O}_7$ as primary standard.**
- 4. Estimation of water of crystallization in Mohr's salt by titrating with KMnO_4 .**

SCHEME OF VALUATION

- 1. Record-10M**
- 2. Practical-40M**
 - Titrimetric analysis-30M**
 - Viva questions = 10 M**

TOTAL = 50 M

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

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SEMESTER – IV

SUBJECT: CHEMISTRY

PAPER CODE: CHE-

401

PAPER TITLE : SPECTROSCOPY & PHYSICAL CHEMISTRY, PAPER-IV

60 hrs(4h/w)

Credits-3

SPECTROSCOPY

UNIT-I

1. Spectrophotometry (10+5)

8h

General features of absorption - Beer-Lambert's law and its limitations, transmittance, Absorbance, and molar absorptivity. Single and double beam spectrophotometers. Application of Beer-Lambert law for quantitative analysis of 1. Chromium in $K_2Cr_2O_7$
2. Manganese in Manganous sulphate.

2. Electronic spectroscopy: (10+5)

6h

Interaction of electromagnetic radiation with molecules and types of molecular spectra. Energy levels of molecular orbitals (σ , π , n). Selection rules for electronic spectra. Types of electronic transitions in molecules effect of conjugation. Concept of chromophore and auxochrome

UNIT-II

1. Infra red spectroscopy (10)

6h

Different Regions in Infrared radiations. Modes of vibrations in diatomic and polyatomic molecules. Characteristic absorption bands of various functional groups. Interpretation of spectra-Alkanes, Aromatic, Alcohols carbonyls, and amines with one example to each.

2. Proton magnetic resonance spectroscopy (H^1 -NMR) (10+10)

10h

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

PHYSICAL CHEMISTRY

UNIT-III

Photochemistry (10+5+5)

10h

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, hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence, Photosensitized reactions- energy transfer processes (simple example)

UNIT-IV

Electrochemistry (10+5+5)

15h

Specific conductance, equivalent conductance. Variation of equivalent conductance with dilution. Application of conductivity measurements- conductometric titrations. Arrhenius theory of electrolyte dissociation and its limitations. Ostwald's dilution law. Debye-Huckel-Onsagar's equation for strong electrolytes (elementary treatment only). Definition of transport number, determination by Hittorf's method. Single electrode potential, Nernst equation, Reversible and irreversible cells, Types of electrode-Standard Hydrogen electrode, calomel electrode, Indicator electrode, metal – metal ion electrode, Inert electrode. Applications of EMF measurements - Potentiometric titrations.

UNIT-V

Phase rule

(10+5) marks

5h

Concept of phase, components, degree of freedom. Derivation of Gibbs phase rule-reduced phase equation. Phase equilibrium of one component (water system). Phase equilibrium of two- component system(Ag-Pb system), desilverisation of lead. Freezing mixtures.

List of Text Books

1. Advanced physical chemistry by Guru deep Raj
2. Introduction to Electrochemistry by S. Glasstone
3. Elementary organic spectroscopy by Y.R. Sharma
4. Spectroscopy by P.S.Kelsi
5. Unified chemistry Vol- II by O.P. Agarwal
6. Unified chemistry Vol- II by K.Ramarao and Y. R. Sharma (Kalyani Publishers)

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SEMESTER – IV	PAPER CODE : CHE-401	ACADEMIC YEAR-2020-21
PAPER TITLE : SPECTROSCOPY AND PHYSICAL CHEMISTRY, PAPER-IV, Model question -paper2020-21		
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 short notes on spectro photometers.
2. Explain the effect of Conjugation on UV spectrum.
3. Write the differences between thermal and photo chemical process.
4. Explain Stark-Einstein's law of photo chemical equivalence.
5. Write the applications of EMF measurements.
6. Derive Nernst equation.
7. State and explain Gibbs Phase rule.

SECTION-B

Answer any FIVE questions. Each question carries 10 marks.

5X10=50M

8. State and explain Beer- Lamberds law? Explain the qualitative analysis of manganese in manganous sulphate.
9. Explain the effect of polar solvents on $n \rightarrow \pi^*$ and $\pi \rightarrow \pi^*$ transitions.
10. Explain the origin and principle in the Infrared spectra.
11. What do you understand by the term splitting of the signals? Explain with example.
12. Give the principle and theory involved in PMR Spectroscopy.
13. What is quantum yield? Explain H_2-Br_2 reaction with mechanism.
14. Explain the potentiometric titrations.
15. Write Phase rule. Draw and explain the phase diagram of water system.

**The Guidelines to be followed by the question paper setters in chemistry for the
IV-Semester - end exams ACADEMIC YEAR-2020-21**

SEMESTER – IV	SUBJECT: CHEMISTRY	PAPER CODE: CHE-401
PAPER TITLE : SPECTROSCOPY & PHYSICAL CHEMISTRY, PAPER-IV		

Weightage for the question paper

syllabus	Section-A (Short answer questions)	Section-B (Essay questions)
Unit-1 (30 Marks)	1 + 1	1 + 1
Unit-2 (30 Marks)	---	1 + 1+1
Unit-3 (20 Marks)	1 +1	1
Unit-4 (20 Marks)	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.

A.G. &S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE (AUTONOMOUS), VUYYURU
(Accredited at "A" Grade by NAAC, Bangalore) ACADEMIC YEAR-2020-21

PRACTICAL SYLLABUS

Physical Chemistry and IR Spectral Analysis	PAPER CODE : CHE - 401 P
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30 hrs (2h /w) Credits-2

Physical Chemistry

1. Potentiometric titration of a Mohr's solution with KMnO_4 Solution.
2. Potentiometric titration of a Mohr's solution with $\text{K}_2\text{Cr}_2\text{O}_7$ solution.
3. Conductometric titration of a strong acid (HCl)) with a strong base(NaOH).
4. Conductometric titration of a weak acid (CH_3COOH) with a strong base (NaOH).
5. Conductometric titration of a mixture of a strong acid (HCl) and weak acid (CH_3COOH) with a strong base (NaOH)

Student study Project-(IR Spectral Analysis)

IR Spectral Analysis of the following functional groups with examples

- a) Hydroxyl groups
- b) Carbonyl groups
- c) Amino groups
- d) Aromatic groups

SCHEME OF VALUATION

1. Internal marks

- **Record = 10**

2. External marks- 40

- **Practical-25**
- **Viva = 10**
- **IR Spectral analysis = 5 (Student study Project)**

Total marks =50

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE (AUTONOMOUS), VUYYURU.
(Accredited at "A" Grade by NAAC, Bangalore) ACADEMIC YEAR-2020-21

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

60hrs (4h / w) Credits-3

UNIT-I

Quantitative analysis: (10+5)

15h

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.

UNIT-II

Treatment of analytical data: (10+5)

8h

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.

UNIT-III

Separation Techniques in Chemical analysis (10+10+5)

15h

Solvent extraction: Introduction, principle, techniques, factors affecting solvent Extraction, Batch extraction, continuous extraction. Synergism. Application - Determination of Iron (III), organic mixture analysis.

UNIT – IV

12h

Chromatography (10+10+5+5)

Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, R_f values, factors effecting R_f 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. Two dimensional chromatography, applications.

UNIT -V (10+10+5+5)

10h

Thin layer Chromatography (TLC):

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.

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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SEMESTER – VI	PAPER CODE : CHE-601GE
PAPER TITLE : ANALYTICAL METHODS IN CHEMISTRY, PAPER-VII, <u>Model question paper- AC-2020-21</u>	

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 in brief steps 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 –AC-2020-21

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

Paper title: Chromatography & Volumetric analysis	Paper code : CHE-601GE-P
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30 hrs (2h /w) Credits-2

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 MARKS-40

- **Titrimetric analysis -30**
- **Viva-10**

TOTAL = 50 M

SEMESTER – VI	SUBJECT: CHEMISTRY	PAPER CODE:CHE-602CE
PAPER TITLE : ORGANIC SPECTROSCOPIC TECHNIQUES,		Cluster Elective Paper – VIII

60hrs (4h / w) Credits-3

UNIT-I

NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY (10+10+5) 15h

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.

UNIT-II (10+5)

NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY 8h

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, AX₂ and AB type with one example.

UNIT-III (10+10+5+5) 14h

Electron Spin Resonance Spectroscopy

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 (CH₃) (d) Benzene anion (C₆H₆) (e) [Cu(H₂O)₆]⁺²

UNIT-IV

UV & VISIBLE SPECTROSCOPY (10+10+5+5) 15h

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.

UNIT-V (10+5) 8h

Electronic spectra of polyatomic molecules

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.

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 Morrill.
3. Organic Spectroscopy- William Kemp.
4. Fundamentals of Molecular Spectroscopy- C.N.Banwell and E.A. Mc cash 4thEdition, 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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SEMESTER – VI	PAPER-VIII	PAPER CODE : CHE-602CE
PAPER TITLE : ORGANIC SPECTROSCOPIC TECHNIQUES, Model question paper-AC-2020-21		

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 Nuclear spin?
2. Write any two types of coupling constant?
3. Write about Kramer degeneracy?
4. What is isotropic and anisotropic constants?
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(H₂O)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

AC- 2020-21

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.

SEMESTER – VI	SUBJECT: CHEMISTRY	PAPER CODE:CHE-
603CE		
PAPER TITLE : ADVANCED ORGANIC REACTIONS, Cluster Elective Paper – IX		

60hrs (4h / w) Credits-3

UNIT – I

ORGANIC PHOTOCHEMISTRY (10+10+5) 10hrs

Organic photochemistry: Molecular orbitals, carbonyl chromophore–Jablonski diagram, Photochemical reactions- Photo reduction-mechanism, example-aromatic compounds. sensitizer and influence of sensitizer.

UNIT – II

ORGANIC PHOTOCHEMISTRY (10+10+5) 12hrs

Norrish cleavages, type -I: Mechanism, acyclic cyclic diones, Photo Fries rearrangement. Norrish 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.

UNIT – III

PROTECTING GROUPS AND ORGANIC REACTIONS (10+10+5+5) 15hrs

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.

UNIT – IV

SYNTHETIC REACTIONS: (10+5+5) 8hrs

Mannich reaction – Mannich bases – Robinson annulations. The Shapiro reaction, Stork–enamine reaction. Use of dithioacetals – Umpolung, phase transfer catalysis – mechanisms and use of benzyl trialkyl ammonium halides. Wittig reaction.

UNIT – V : NEW SYNTHETIC REACTIONS(10+5) 15hrs

Define with example and mechanism- Suzuki coupling, Click reaction, Baylis–Hillman reaction, RCM olefin metathesis, Mukayama aldol reaction.

Define with one example: (Mechanism not required) Mitsunobu reaction, McMurry reaction, Julia–Lythgoe olefination, Stille coupling and Heck reaction.

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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SEMESTER – VI PAPER-IX

PAPER CODE : CHE-603CE

PAPER TITLE : ADVANCED ORGANIC REACTIONS , Model question paper-AC-2020-21

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 –AC-2020-21

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

Paper – IX 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 (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.

SEMESTER – VI	SUBJECT: CHEMISTRY	PAPER CODE:CHE-
	604CE	
PAPER TITLE : PHARMACEUTICAL AND MEDICINAL CHEMISTRY, Cluster Elective Paper –X		

60hrs (4h / w) Credits-3

UNIT-I (10+5+5) 12h

Pharmaceutical chemistry Terminology: Pharmacy, Pharmacology, Pharmacophore, Pharmacodynamics, Pharmacokinetics (ADME, Receptors - brief treatment) Metabolites and Anti metabolites.

UNIT-II (10+10+5)

Drugs: 10h

Nomenclature: Chemical name, Generic name and trade names with 10-examples
Classification based on structures and therapeutic activity with one example each.

UNIT-III

Synthesis and therapeutic activity of the compounds: 18h

Chemotherapeutic Drugs (10+10+5)

1.Sulphadruugs(Sulphamethoxazole) 2.Antibiotics - β -Lactam Antibiotics-Isolation of Penciline
by submerged culture method, 3. Anti malarial Drugs (chloroquine)

Psycho therapeutic Drugs: (10+5)

1.Anti pyretics (Paracetamol) 2.Hypnotics, 3.Tranquilizers(Diazepam) 4.Levodopa

UNIT-IV

Pharmacodynamic Drugs: (10+5) 8h

1.Antiasthma Drugs (Solbutamol) 2. Antianginals (Glycerol Trinitrate) 3.Diuretics (Frusemide)

UNIT-V

HIV-AIDS: (10+5) 12h

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).

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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SEMESTER – VI	PAPER-X	PAPER CODE : CHE-604CE
PAPER TITLE : PHARMACEUTICAL AND MEDICINAL CHEMISTRY, Model question paper-AC-2020-21		

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 AC-2020-21

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

Paper title: Preparations of Organic compounds	Paper code : CHE-602CE-P
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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 MARKS-40M

- Titrimetric analysis -30
- Viva-10

TOTAL = 50 M

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(Accredited at "A" Grade by NAAC, Bangalore)

Practical syllabus

Paper title: Preparations of Organic compounds by Green procedure	Paper code : CHE-603CE-P
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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 MARKS-40 M
 - Practical -30
 - Viva-10

TOTAL = 50 M

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Department of Chemistry

Paper title: Project work	Paper code : CHE-604CE-P
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The students have chosen chemistry as cluster elective. "Laboratory Reagents" 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

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

(Accredited at "A" Grade by NAAC) ACADEMIC YEAR-2020-21

SEMESTER - II	PAPER CODE :
PAPER TITLE : FOOD ADULTERATION	

UNIT-I: Total: 30Hrs (2h/week) 02 Credits

Common Foods and Adulteration(10+10+5+5) 10Hrs

Common Foods subjected to Adulteration-Adulteration-Definition –Types; Poisonous substances, Foreign matter, cheap substitutes, Spoiled parts. Adulteration through Food Additives –Intentional and incidental. General Impact on Human Health.

UNIT-II :

Adulteration of Common Foods and Methods of Detection (10+10+5+5+5) 10Hrs

Means of Adulteration Methods of Detection Adulterants in the following Foods; Milk, Oil, Grain, Sugar, Spices and Condiments, Processed Food, Fruits and Vegetables. Additives and Sweetening agents (at least three methods of detection for each food item).

UNIT-III:

Present Laws and Procedures on Adulteration(10+10+5+5+5)

10Hrs

Highlights of Food Safety and Standards Act 2006 (FSSA) –Food Safety and Standards Authority of India- Rules and Procedures of Local Authorities.Role of Voluntary Agencies Suchas, Agmark, I.S.I. Quality control laboratories of Companies, Private testing laboratories, Quality control laboratories of Consumer co-operatives.

Consumer Education, Consumer's problems, rights and responsibilities, COPRA2019-Offenses and Penalties-Procedures to Complain –Compensation to Victims.

Reference books and Websites:

- 1.A first course in Food Analysis – A.Y. Sathe,New Age International (p) Ltd, 1999
2. Food Safety, case studies –Ramesh.V.Bhat,NIN,1992
- 3.[https://old.fssai.gov.in/Portals/0/Pdf/](https://old.fssai.gov.in/Portals/0/Pdf/Draft%20Manuals/Beverages%20and%20Confectionary.pdf) Draft Manuals/ Beverages and Confectionary.pdf
- 4.<https://www.fssai.gov.in/>
- 5.<https://indianlegalsolution.com/laws-on-food-adulteration/>
- 6.<https://fssai.gov.in/dart/>
- 7.<https://byjus.com/biology/food-adulteration/>

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ACADEMIC YEAR-2020-21

SEMESTER – II	COURSE CODE :
PAPER TITLE : FOOD ADULTERATION ,PAPER - II	

Time: 2 Hours

Maximum marks: 50

Pass marks:20

SECTION-A

Answer any FOUR Questions. Each question carries 5 marks. 4X5=20Marks

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION-B

Answer any THREE Questions. Each question carries 10 marks. 3X10=30M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.

The Guidelines to be followed by the question paper setters in Chemistry for the
II-Semester - end exams. ACADEMIC YEAR-2020-21

Weightage for the question paper-FOOD ADULTERATION

syllabus	Section-A (Short answer questions)	Section-B (Essay questions)
Unit-1 (30Marks)	1+1	1+1
Unit-2 (35Marks)	1+1+1	1+1
Unit-3 (35Marks)	1+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.