

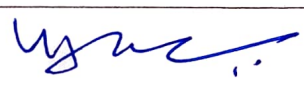


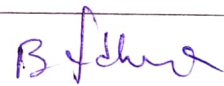
S.R.R. & C.V.R. GOVT DEGREE COLLEGE (Autonomous), VIJAYAWADA

DEPARTMENT OF CHEMISTRY

Minutes of the meeting of the board of studies

In the subject of Chemistry for VI Semester

The meeting of the Board of studies in the subject of Chemistry for VI semester was held on 4th September 2019 in the Department of Chemistry, SRR & CVR Govt. Degree College (A), Vijayawada. The following members attended the meeting:

S.No.	Name of the Member	Designation	Signature
1	Dr.V.Neeraja	Incharge of the Dept. & Chairman, BOS	
2.	Dr.D.Rama Sekhar Reddy	University Nominee	
3.	Dr.Y.Hanumatha Rao	Subject expert	
4.	Dr.Bhaskara Rao	Subject expert	
5.	K.V.S.Prasad	Faculty Member	
6.	Dr.G.Nagarjuna	Faculty Member	
7.	Dr.V.Phani Kumar	Faculty Member	
8.	G.V.Swaroop Singh	Faculty Member	
9.	Dr.Sudhasmsa Prabhakar	Faculty Member	
10.	Ch.Siva Prasad	Faculty Member	

AGENDA:





- Item 1 : Approval of syllabus for Semester VI for the academic year 2019-2020.
- Item 2 : Approval of Question paper, blue print and model paper
- Item 3 : Approval of list of paper setters and examiners
- Item 4 : Any other item with the approval of the chair

The Chairperson, Board of Studies welcomed the members and initiated discussion on the syllabus for VI semester. He appraised the members of the guidelines of the UGC and the CCE regarding the framing of syllabus and then recommended evaluation ratio for internal and external examinations. The members discussed in detail the various aspects presented before them and unanimously resolved the following:

RESOLUTIONS:

- Resolved to adopt the present University CBCS syllabus for semester VI with the suggested modifications.
- Resolved to approve the division of marks for internal and external examinations along with the suggested blue print and model paper
- Resolved to approve the list of paper setters' sand examiners submitted by the department.

Syllabus for CBCS semester VI
 Question paper blue print for CBCS semester VI
 Model Paper for CBCS semester VI
 List of paper setters and examiners

S.No.	Name of the Member	Designation	Signature
1	Dr.V.Neeraja	Incharge of the Dept. & Chairman, BOS	
2.	Dr.D.Rama Sekhar Reddy	University Nominee	
3.	Dr.Y.Hanumatha Rao	Subject expert	
4.	Dr.Bhaskara Rao	Subject expert	
5.	K.V.S.Prasad	Faculty Member	
6.	Dr.G.Nagarjuna	Faculty Member	
7.	Dr.V.Phani Kumar	Faculty Member	
8.	G.V.Swaroop Singh	Faculty Member	
9.	Dr.Sudhasmsa Prabhakar	Faculty Member	
10.	Ch.Siva Prasad	Faculty Member	

SRR&CVR GOVERNMENT DEGREE COLLEGE (A),

VIJAYAWADA

B.Sc. Chemistry Syllabus under CBCS

VI SEMESTER (w. e. f. 2019-20)

STRUCTURE OF CHEMISTRY SYLLABUS UNDER CBCS

YEAR	SEMESTER	PAPER	TITLE	MARKS	CREDITS		
III	VI *Any one Paper from VII A or B	VII (A)*	Elective A	100	03		
			Practical - VII A	50	02		
		VII (B)*	Elective B	100	03		
			Practical - VII B	50	02		
	VI ** Any one cluster from VIII, A or B	VIII (A)**	Cluster Elective - I				
			VIII-A-1	100	03		
			VIII-A-2	100	03		
			VIII-A-3	100	03		
			PRACTICAL	50	02		
			PRACTICAL	50	02		
			PROJECT	50	02		
		VIII (B)**	Cluster Elective- II				
			VIII-B-1	100	03		
			VIII- B-2	100	03		
			VIII-B-3	100	03		
			PRACTICAL	50	02		
			PRACTICAL	50	02		
			PROJECT	50	02		

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SEMESTER-VI - Electives
ELECTIVE Paper – VII : ANALYTICAL METHODS
IN CHEMISTRY

45hrs (3h / w)

UNIT-I

Quantitative analysis:

10h

a) Importance in various fields of science, steps involved in chemical analysis. Principles 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:

7h

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:

8h

SOLVENT EXTRACTION : Introduction, principle, techniques, factors affecting solvent extraction, Batch extraction, continuous extraction and counter current extraction.

ION EXCHANGE : Introduction, action of ion exchange resins, separation of inorganic mixtures, applications.

UNIT - IV

10h

Chromatography: Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, R_f values, factors effecting R_f values.

Paper Chromatography: Principles, R_f values, experimental procedures, choice of paper and solvent systems, developments of chromatogram - ascending, descending and radial. Two dimensional chromatography, applications.

UNIT - V

10h

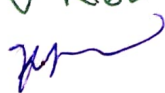
Thin layer Chromatography (TLC): Advantages. Principles, factors effecting R_f values. Experimental procedures. Adsorbents and solvents. Preparation of plates. Development of the chromatogram. Detection of the spots. Applications.

Column Chromatography: Principles, experimental procedures, Stationary and mobile Phases, Separation technique. Applications

HPLC : Basic principles 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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PAPER – VII (A) – ELECTIVE PAPER

ANALYTICAL MEHTODS IN CHEMISTRY

Weightage of Marks (Blue Print)

Sl.No.	Name of the Topic	Essay	Short Questions
1.	Unit-I : Quantitative Analysis	2	2
2	Unit-II : Treatment of Analytical data	2	2
3.	Unit-III : Separation Techniques in Chemical Analysis	2	2
4.	Unit-IV : Chromatography	2	2
5.	Thin Layer Chromatography	2	2

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**SEMESTER – VI
ELECTIVE PAPER – VII (A)**

ANALYTICAL METHODS IN CHEMISTRY

Model Question Paper

Time : 3 Hours

Max.Marks : 60

Section – A

Answer any five questions

5 x 4 = 20 Marks

1. Explain Iodometric titrations with suitable examples
2. Define accuracy and precision
3. Write short note on Batch extraction
4. Write one method of expressing precision
5. Explain stationary phase and mobile phase
6. Explain principles of volumetric analysis
7. Write about solvent extraction
8. Write about applications of HPLC
9. What is descending paper chromatography
10. What is R_f Value ? Give Factors effecting R_f Values

Section – B

Answer 5 questions

5 x 8 = 40 Marks

11. Write about EDTA Titrations
OR
12. Explain choice of indicators in redox, acid base and complexometric titrations.
13. Give an account of significant figures and their importance
OR
14. Explain standard deviation and confidence limit
15. Explain how inorganic mixtures are separated Ion exchange method
OR
16. Write notes on (a) Continuous extraction (b) estimation of Fe^{3+} ion using solvent extraction.
17. Explain the experimental details of paper chromatography and its applications.
OR
18. Give the description of column chromatography
19. Explain thin layer chromatography and its applications
OR
20. Write note on (a) HPLC (b) Solvent systems

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SEMESTER – VI
ELECTIVE PAPER – VII-(B) : ENVIRONMENTAL CHEMISTRY

45 hrs (3 h / w)

UNIT-I

9 h

Introduction

Concept of Environmental Chemistry – Nomenclature of environmental chemistry – Segments of environment – Natural resources – Renewable Resources – Solar and biomass energy and Nonrenewable resources – Thermal power and atomic energy – Reactions of atmospheric Oxygen and Hydrological cycle.

Additional Inputs: Environmental management

UNIT – II

9 h

Air Pollution

Definition – Sources of Air Pollution – Classification of air pollution – Acid rain – Photochemical smog – Green house effect – Formation and depletion of ozone – Bhopal Gas disaster – Controlling methods of air pollution.

UNIT – III

Water Pollution

9 h

Unique physical and chemical properties of water – quality and criteria for finding of water quality – Dissolved Oxygen – BOD, COD, Suspended solids, total dissolved solids, alkalinity – Hardness of water – Methods to convert temporary hard water into soft water – Methods to convert permanent hard water into soft water – eutrophication and its effects – principal wastage treatment – Industrial waste water treatment.

UNIT – IV

Chemical Toxicology

9 h

Toxic chemicals in the environment – effects of toxic chemicals – cyanide and its toxic effects – pesticides and its biochemical effect – toxicity of lead, mercury, arsenic and cadmium.

Additional Inputs : Carcinogens

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UNIT – V

Ecosystem and biodiversity

Ecosystem

9 h

Concepts – structure – Functions and types of ecosystem – Abiotic and biotic components – Energy flow and Energy dynamics of ecosystem – Food chains – Food web – Tropic levels – Biogeochemical cycles (carbon, nitrogen and phosphorus)

Biodiversity

Definition – level and types of biodiversity – concept – significance – magnitude and distribution of biodiversity – trends – biogeographical classification of India – biodiversity at national, global and regional level.

Additional Inputs: Threat to biodiversity, Conservation of biodiversity.

List of Reference books

1. Fundamentals of ecology by M.C.Dash
2. A Text book of Environmental Chemistry by W.Moore and F.A.Moore
3. Environmental Chemistry by Samir K.Banerji
4. Environmental Chemistry by AKDEY

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PAPER – VII B – ELECTIVE PAPER

ENVIRONMENTAL CHEMISTRY

Weightage of Marks (Blue Print)

Sl.No.	Name of the Topic	Essay	Short Questions
1.	Unit-I : Introduction	2	2
2	Unit-II : Air Pollution	2	2
3.	Unit-III : Water Pollution	2	2
4.	Unit-IV : Chemical Toxicity	2	2
5.	Unit-V : Ecosystem & Biodiversity	2	2
	Total :	10	10

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ELECTIVE PAPER – VII (B)

ENVIRONMENTAL CHEMISTRY

Model Question Paper

Time : 3 Hours

Max.Marks : 60

Section – A

Answer any five questions

5 x 4 = 20 Marks

1. What are the different segments of Environment?
2. What is TDS ? How is it Measured?
3. What is alkalinity of water? How it is determined.
4. Write short notes on acid rain
5. Discuss the toxic effects of Lead and Mercury.
6. Explain about energy flow and energy dynamics I ecosystem.
7. Write short notes on hydrological cycle.
8. Explain briefly depletion of ozone layer.
9. Discuss briefly about carcinogens.
10. Explain conservation of biodiversity.

Section – B

Answer 5 questions

5 x 8 = 40 Marks

11. How does atmosphere Oxygen helps in producing energy
OR
12. Give Nomenclature of Environmental chemistry
13. Explain the classification of Air pollutions and mention some air pollutants.
OR
14. Explain about (a) Photochemical smog (b) Green house effect.
15. Explain any two methods of converting hard water into soft water
OR
16. Explain about (a) DO (b) BOD and (c) COD
17. Mention any four toxic chemicals in the environment discuss their harmful effects.
OR
18. Explain the toxic effects of (a) Cyanide and (b) Pesticides
19. Explain the functions and types of Ecosystem
OR
20. What is biodiversity? Explain its level and types of Biodiversity.

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Cluster Elective –I
ORGANIC
PAPER – VIII-A 1 : ORGANIC SPECTROSCOPIC TECHNIQUES
45 hrs (3 h / w)

UNIT-I **10h**

NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY

Nuclear spin, Principles of NMR, Magnetic moment and Spin angular momentum. Larmor Frequency, Instrumentation. Relaxation Spin-spin & spin lattice relaxation. Shielding constants, Chemical shifts, Shielding and De shielding mechanism-Factors influencing Chemical shift. Spin-Spin interactions- AX, AX₂ and AB types. Vicinal, Geminal and Long range coupling- Factors influencing coupling constants.

UNIT – II **5h**

Spin decoupling, Spin tickling, Deuterium exchange, Chemical shift reagents and Nuclear overhauser effect. Applications in Medical diagnostics, FT NMR and its Advantages.

UNIT-III **10h**

UV & VISIBLE SPECTROSCOPY

The Born-Oppenheimer approximation , Vibrational coarse structure: Bond association and Bond sequence. Intensity of Vibrational-electronic spectra: The Franck-Condon principle. Types of transitions, Chromophores, Conjugated dienes, trienes and polyenes, unsaturated carbonyl compounds-Woodward – Fieser rules.

UNIT-IV **5h**

Beer-Lambert's Law. Deviation from Beer's law. Quantitative determination of metal ions (Mn⁺², Fe⁺², NO₂⁻¹, Pb⁺²). Simultaneous determination of Chromium and Manganese in a mixture.

UNIT-V **15h**

ELECTRON SPIN RESONANCE SPECTROSCOPY

Basic Principles, Theory of ESR, Comparison of NMR & ESR., Factors affecting the 'g' value, determination of 'g' value. Isotropic and Anisotropic constants. Hyper fine splitting coupling constants. Zero field splitting and Kramer degeneracy.

Applications:- Detection of free radicals; ESR spectra of (a) Methyl radical (CH₃•), (b) Benzene anion (C₆H₆⁻) (c) Isoquinine (d) [Cu(H₂O)₆]⁺² (e) [Fe(CN)₅NO]⁻³

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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. McCash 4th Edition, Tata Mc Graw Hill Publishing Co., Ltd. 1994.
5. Physical Methods in Inorganic Chemistry – R.S.Drago, Saunders Publications.
6. NMR, NQR, EPR and Mössbauer Spectroscopy in Inorganic chemistry – R.V Parish, Ellis, Harwood.
7. Instrumental Methods of Chemical Analysis- H.Kaur, Pragathi Prakashan, 2003.
8. Instrumental Methods of Analysis, 7th Edition – Willard, Merrit, Dean, Settle, CBS Publications, 1986.
9. Molecular Structure and Spectroscopy – G. Aruldhas, Prentice Hall of India Pvt.Ltd, New Delhi, 2001.
10. Coordination Chemistry: Experimental Methods- K. Burger, London Butter Worths, 1973.
11. Analytical spectroscopy – Kamlesh Bansal, Campus Books, 2008.

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I. LABORATORY COURSE – VIII

Practical Paper – VIII-A-1: (At The End of Semester VI) 30 hrs (2 h / W)

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

II. LABORATORY COURSE – VIII

Practical Paper – VIII-A-2 (At The End of Semester VI) 30 hrs (2 h / W)

1. Green procedure for organic qualitative analysis: Detection of N, S and halogens
2. Acetylation of 10 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.

III. Practical:- Project Work

List of Reference Books

1. Green Chemistry Theory and Practice. P.T. Anatas and J.C. Warner
2. Green Chemistry V.K. Ahluwalia Narosa, New Delhi.
3. Real world cases in Green Chemistry M.C. Cann and M.E. Connelly
4. Green Chemistry: Introductory Text M.Lancaster: Royal Society of Chemistry (London)
5. Green Chemistry: Introductory Text, M.Lancaster
6. Principles and practice of heterogeneous catalysis, Thomas J.M., Thomas M.J., John Wiley
7. Green Chemistry: Environmental friendly alternatives R S Sanghli and M.M Srivastava, Narosa Publications

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Cluster Elective –I
ORGANIC
PAPER – VIII-A 1 : ORGANIC SPECTROSCOPIC TECHNIQUES
BLUE PRINT

WEIGHTAGE OF MARKS

S. No	NAME OF THE TOPIC/UNIT	ESSAY QUESTIONS	SHORT ANSWER QUESTIONS
1	UNIT-I Nuclear Magnetic Resonance Spectroscopy	2	2
2	UNIT-II	2	2
3	UNIT-III UV & Visible Spectroscopy	2	2
4	UNIT-IV	2	2
5	UNIT-V Electron Spin Resonance Spectroscopy	2	2

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SRR&CVR GOVERNMENT DEGREE COLLEGE (A), VIJAYAWADA

B.Sc CHEMISTRY (CLUSTER ELECTIVE –III) VI SEMESTER

ORGANIC PAPER – VIII-A 1

ORGANIC SPECTROSCOPIC TECHNIQUES

TIME: 3 HOURS

MAX MARKS: 60

SECTION –A (SHORT ANSWER QUESTIONS)

Answer Any Five of the following.

5 X 4 = 20 Marks

1. Explain Larmour Frequency.
2. Explain Vicinal and Geminal Coupling.
3. Explain Spin Decoupling.
4. Explain Chemical Shift Reagents with examples.
5. Explain Born- Oppenheimer Approximation.
6. Explain Frank Condon Principle.
7. Explain the deviations of Beer-Lambert's Law.
8. Explain the quantitative determination of NO_2^{-1} ion using Beer-Lambert's Law.
9. Explain the ESR spectrum of Methyl radical.
10. Explain factors affecting "g" value.

SECTION –B (ESSAY QUESTIONS)

Answer Any Five of the following.

5 X 8 = 40 Marks

UNIT-I

11. Explain the Shielding and Deshielding Mechanism and write the factors influencing them.

OR

12. What is Spin-Spin Interaction? Explain Spin-Spin Interaction in AX and AB types of molecules.

UNIT-II

13. What is Nuclear Overhauser Effect? Write the applications of NOE in medical medical diagnosis.

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14. What is FT NMR technique? Write its advantages over NMR.

UNIT-III

15. Explain Frank- Condon Principle. Explain Vibrational Coarse structure of molecules.

OR

16. Write the Woodward-Fieser rules for the calculation of λ_{max} of unsaturated carbonyl compounds with an example.

UNIT-IV

17. Explain Beer- Lambert's law and explain its deviations from Beer's law.

OR

18. Explain the quantitative determination of Mn^{+2} and Fe^{+2} ions using Beer- Lambert's law.

UNIT-V

19. Explain Hyper field splitting in ESR Spectroscopy.

OR

20. Compare NMR with ESR Spectroscopy.

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UNIT – I

9 hours

ORGANIC PHOTOCHEMISTRY: Organic photo chemistry: Molecular orbitals, carbonyl chromophore–triplet states, Jablonski diagram, inter–system crossing. Energy transfer. Energies properties and reaction of singlet and triplet states of and transitions. Photochemical reactions: (a) Photoreduction, mechanism, Applications,

Additional Inputs: (b) Paterno Buchi Reaction, Mechanism, Application

UNIT – II

9 hours

ORGANIC PHOTOCHEMISTRY: Norrish cleavages, type I: Mechanism, Norrish type II cleavage: Mechanism and stereochemistry, type II reactions of esters, 1,2-diketones, Di - π methane rearrangement, Photo Fries rearrangement, Photochemistry of conjugated dienes, Decomposition of nitrites – Barton reaction.

Additional Inputs: Photo Chemistry of aromatic compounds.

UNIT – III

9 hours

PROTECTING GROUPS AND ORGANIC REACTIONS: Principles of (1) Protection of alcohols – ether formation including silyl ethers – ester formation, (2) Protection of carboxylic acids – ester formation, benzyl and t-butyl esters, (3) Protection of amines – acetylation, benzylation, benzyloxy carbonyl, triphenyl methyl groups and fmoc, (4) Protection of carbonyl groups – acetal, ketal, 1,2–glycols and 1,2–dithioglycols formation.

UNIT – IV

9 hours

SYNTHETIC REACTIONS: Mannich reaction - Mannich bases , Robinson ring annulations. The Shapiro reaction, Stork–enamine reaction. Wittig reaction.

Additional Input: Hoff-man rearrangement, Diels alder reaction, stereo chemistry, sulphur ylides.

UNIT –V

9 hours

NEW SYNTHETIC REACTIONS McMurrey reaction, Peterson's stereoselective olefination, Heck reaction, Suzuki coupling, Stille coupling and Sonogishira coupling.

Additional Input: Bayer Villiger oxidation, Schmidt Reaction, Simmons-Smith reaction, Birch reduction, Claisen rearrangement, Favorskii rearrangement.

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.
9. Organic Chemistry Claydon and others 2005.
10. Name Reactions by Jie Jack Li
11. Reagents in Organic synthesis by B.P. Mundy and others.

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CLUSTER-2

ORGANIC PAPER - VIII-A-2

ADVANCED ORGANIC REACTIONS

Weightage of marks (Blue Print)

S.No	Name of the Topic	Essay Questions	Short Questions
1	Unit- 1 ORGANIC PHOTOCHEMISTRY	2	2
2	Unit- 2 ORGANIC PHOTOCHEMISTRY	2	2
3	Unit- 3 PROTECTING GROUPS AND ORGANIC REACTIONS	2	2
4	Unit- 4 SYNTHETIC REACTIONS	2	2
5	Unit- 5 NEW SYNTHETIC REACTIONS	2	2
Total		10	10

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SRR & CVR GOVT. DEGREE COLLEGE (A) :: VIJAYAWADA
CLUSTER-2
ORGANIC PAPER – VIII-A-2
ADVANCED ORGANIC REACTIONS
MODEL PAPER

Max. Marks: 60

Time : 3hr

PART-A

I. Answer any Five Questions

5x4=20 Marks

1. Explain the terms Intersystem crossing, fluorescence.
2. What is Di - π methane rearrangement? Give example.
3. Explain the protection of amines using fmoc.
4. What is Shapiro reaction? Give equation.
5. What is Wittig reaction? Give equation.
6. What is Barton reaction? Give equation.
7. What is Simmons-Smith reaction?
8. Write about Favorskii rearrangement with one example.
9. Explain the protection & de protection of carboxylic acids by using benzyl ester.
10. Write the mechanism of Photo Reduction.

PART - B

II. Answer all the Questions

5x8=40 Marks

11. Explain in detail the Jablonski diagram.
(or)
12. Write Paterno Buchi Reaction, Mechanism and Application.
13. Explain Norrish type II cleavage with mechanism.
(or)
14. Explain the Photo chemistry of aromatic compounds.
15. Explain the protection & deprotection of Alcohols
I) Ether formation II) ester formation
(or)
16. Explain the protection & deprotection of carbonyl groups
17. Explain the Mannich reaction with mechanism.
(or)
18. Explain the Stork-enamine reaction with mechanism.
19. Explain the McMurry reaction & Heck reaction.
(or)
20. Explain the Birch reduction and Favorskii rearrangement.

**SRR & CVR GOVT. DEGREE COLLEGE, (AUTONOMOUS),
VIJAYAWADA**

**Cluster Elective - ~~II~~ I
ORGANIC**

**PAPER – VIII-A 3 : PHARMACEUTICAL AND MEDICINAL CHEMISTRY
45 hrs (3 h / w)
SYLLABUS**

UNIT-I 8h

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

UNIT – II

Drugs: 8h

Nomenclature: Chemical name, Generic name and trade names with examples Classification: Classification based on structures and therapeutic activity with one example each, Administration of drugs

UNIT-III

Synthesis and therapeutic activity of the compounds: 12h

a. Chemotherapeutic Drugs

1. Sulphadruugs (Sulphamethoxazole) 2. Antibiotics - β -Lactam Antibiotics,

b. Psycho therapeutic Drugs: 1. Anti pyretics (Paracetamol) 2. Hypnotics,

3. Tranquilizers (Diazepam) 4. Levodopa

UNIT-IV

Pharmacodynamic Drugs: 8h

1. Antiasthma Drugs (Solbutamol) 3. Antianginals (Glycerol Trinitrate)

4. Diuretics (Frusemide)

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UNIT-V

9h

HIV-AIDS:

Immunity -CD-4cells, CD-8cells, Retro virus, Replication in human body, Investigation available, prevention of AIDS, Drugs available -examples with structures: PIS: Indinavir (crivivan), 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
6. Medicinal Chemistry by Kadametal P-I & P-II.
7. European Pharmacopoeia.

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Cluster Elective –III
ORGANIC
PAPER – VIII-A 3 : PHARMACEUTICAL AND MEDICINAL CHEMISTRY
BLUE PRINT

WEIGHTAGE OF MARKS

S. No	NAME OF THE TOPIC/UNIT	ESSAY QUESTIONS	SHORT ANSWER QUESTIONS
1	UNIT-I	2	2
2	UNIT-II Drugs	2	2
3	UNIT-III Synthesis and therapeutic activity of the compounds	2	2
4	UNIT-IV Pharmacodynamic Drugs	2	2
5	UNIT-V HIV-AIDS	2	2

UNIT-V
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Cluster Elective –III
ORGANIC
PAPER – VIII-A 3 : PHARMACEUTICAL AND MEDICINAL CHEMISTRY
MODEL QUESTION PAPER

TIME: 3 HOURS

MAX MARKS: 60

SECTION –A (SHORT ANSWER QUESTIONS)

Answer Any Five of the following.

5 X 4 = 20 Marks

1. Explain Pharmacophore with an example.
2. What is Metabolites and Anti metabolites?
3. What are a Generic name and a Trade name. Give three examples?
4. Write about administration of Drugs.
5. Write the structure and therapeutic use of Sulphamethoxazole.
6. Explain structure and therapeutic activity of Paracetamol.
7. Write the structure and therapeutic activity of Solbutamol.
8. Write about anti anginals.
9. Describe various preventive methods to control AIDS and HIV infections.
10. What are Hypnotic drugs? Give an example?

SECTION –B (ESSAY QUESTIONS)

Answer Any Five of the following.

5 X 8 = 40 Marks

UNIT-I

11. Explain in detail Pharmacokinetics of the drug.

OR

12. Explain the terms a) Pharmacology b) Pharmacodynamics

UNIT-II

13. Explain classification of Drugs based on therapeutic activity with examples.

OR

14. Explain classification of Drugs based on their structure with examples.

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UNIT-III

15. Explain structure and therapeutic activity of Paracetamol.

OR

16. Write the structure and therapeutic activity of Solbutamol.

UNIT-IV

17. What are Diuretics? Explain the structure and therapeutic activity of Frusemide.

(OR)

18. What are Antianginals? Explain the structure and therapeutic activity of Glyceryl trinitrite.

UNIT-V

19. What is Retrovirus? How HIV virus replicates in human body? What are Anti retroviral drugs?

OR

20. Give the structure and activity of Crixivan (Indinavir).

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Cluster Elective – II
ANALYTICAL AND PHYSICAL
PAPER – VIII-B-1: POLYMER CHEMISTRY
45 hrs (3 h / w)

12h

UNIT-I

INTRODUCTION OF POLYMERS:

Basic definitions, Degree of Polymerization, Classification of polymers- Natural and Synthetic polymers, Organic and Inorganic polymers, Thermoplastic and Thermosetting polymers, Plastics, Elastomers, Fibers and Resins, Linear, Branched and Cross Linked polymers, Addition polymers and Condensation Polymers, mechanism of polymerization. Free radical, ionic and Zeigler – Natta polymerization.

10h

UNIT-II

TECHNIQUES OF POLYMERIZATION :

Bulk polymerization, Solution polymerization, Suspension and Emulsion polymerization.

Molecular weights of polymers: Number average and Weight average molecular weights.

Determination of molecular weight of polymers by Viscometry, Osmometry and light scattering methods.

6h

UNIT-III

Kinetics of Free radical polymerization, Glass Transition temperature(Tg) and Determination of Tg. Free volume theory, WLF equation, factors affecting glass transition temperature (Tg).

UNIT-IV

POLYMER ADDITIVES

Introduction to plastic additives – Fillers, Plasticizers and Softeners, Lubricants and Flow Promoters, Anti aging additives, Flame Retardants, Colourants, Blowing agents, Cross linking agents, Photo stabilizers, Nucleating agents.

9h

UNIT-V

POLYMERS AND THEIR APPLICATIONS

Preparation and Industrial applications of Polyethylene, Polyvinyl chloride, Teflon, Polyacrylonitrile, Terelene, Nylon6,6 .

8h

Reference Books:

1. Seymour, R.B. & Carraher, C.E. *Polymer Chemistry: An Introduction*, Marcel Dekker, Inc. New York, 1981.
2. Odian, G. *Principles of Polymerization*, 4th Ed. Wiley, 2004.
3. Billmeyer, F.W. *Textbook of Polymer Science*, 2nd Ed. Wiley Interscience, 1971.
4. Ghosh, P. *Polymer Science & Technology*, Tata McGraw-Hill Education, 1991.34
5. Lenz, R.W. *Organic Chemistry of Synthetic High Polymers*. Interscience Publishers, New York, 1967.

I. LABORATORY COURSE – VIII

Practical Paper – VIII-B-1: (At The End of Semester VI) 30 hrs (2 h / W)

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

II. LABORATORY COURSE – VIII

Practical Paper – VIII-B-2 (At The End of Semester VI) 30 hrs (2 h / W)

1. Green procedure for organic qualitative analysis: Detection of N, S and halogens
2. Acetylation of 10 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.

III. Practical:- Project Work

List of Reference Books

1. Green Chemistry Theory and Practice. P.T. Anatas and J.C. Warner
2. Green Chemistry V.K. Ahluwalia Narosa, New Delhi.
3. Real world cases in Green Chemistry M.C. Cann and M.E. Connelly
4. Green Chemistry: Introductory Text M.Lancaster: Royal Society of Chemistry (London)
5. Green Chemistry: Introductory Text, M.Lancaster
6. Principles and practice of heterogeneous catalysis, Thomas J.M., Thomas M.J., John Wiley
7. Green Chemistry: Environmental friendly alternatives R S Sanghli and M.M. Srivastava, Narosa Publications

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Cluster Elective –II

ANALYTICAL AND PHYSICAL

PAPER – VIII-B-1: POLYMER CHEMISTRY

BLUE PRINT

WEIGHTAGE OF MARKS

S. No	NAME OF THE TOPIC/UNIT	ESSAY QUESTIONS	SHORT ANSWER QUESTIONS
1	UNIT-I Introduction of Polymers	2	2
2	UNIT-II Techniques of Polymerization	2	2
3	UNIT-III	2	2
4	UNIT-IV Polymer Additives	2	2
5	UNIT-V Polymers And Their Applications	2	2

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SRR&CVR GOVERNMENT DEGREE COLLEGE (A), VIJAYAWADA

B.Sc CHEMISTRY (CLUSTER ELECTIVE –II) VI SEMESTER

**ANALYTICAL AND PHYSICAL PAPER – VIII-B 1
POLYMER CHEMISTRY**

TIME: 3 HOURS

MAX MARKS: 60

SECTION –A (SHORT ANSWER QUESTIONS)

Answer Any Five of the following.

5 X 4 = 20 Marks

1. Explain Thermoplastic and Thermosetting polymers with examples.
2. Explain Zeigler- Natta Polymerisation with example.
3. Define Number average and Weight average molecular weights of Polymers.
4. Write a short note on Emulsion Polymerisation.
5. Explain the factors affecting Tg.
6. Explain Free Volume theory of Polymers.
7. Explain Lubricants and Flow Promoters with examples
8. Explain Anti aging additives and Cross linking agents with examples.
9. Explain the preparation of Polyethylene and give any 2 applications.
10. Explain the preparation of Terelene and give any 2 applications.

SECTION –B (ESSAY QUESTIONS)

Answer Any Five of the following.

5 X 8 = 40 Marks

UNIT-I

11. Explain the mechanism of free radical polymerization.

OR

12. Give an account of classification of Polymers with examples.

UNIT-II

13. Explain the method of determining the molecular weight of a polymer by Osmometry.

OR

14. Give an account of Bulk and Solution Polymerization.

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UNIT-III

15. Discuss the kinetics of Free radical polymerization.

OR

16. Derive WLF equation.

UNIT-IV

17. Discuss the use of Fillers and Plasticizers as additives in Polymers.

OR

18. Explain Flame Retardants, Colourants, Photo Stabilizers and Nucleating agents with examples.

UNIT-V

19. Explain preparation and industrial applications of Teflon and Nylon6, 6.

OR

20. Explain preparation and industrial applications of PVC and PAN.

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PAPER – VIII-B-2
INSTRUMENTAL METHODS OF ANALYSIS

45 hrs (3 h / w)

UNIT – I

4h

Introduction to spectroscopic methods of analysis:
Recap of the spectroscopic methods covered in detail in the core chemistry syllabus:
Treatment of analytical data, including error analysis. Classification of analytical methods and the types of instrumental methods. Consideration of electromagnetic radiation.

UNIT – II

8h

Molecular spectroscopy:

Infrared spectroscopy:

Interactions with molecules: absorption and scattering. Means of excitation (light sources), separation of spectrum (wavelength dispersion, time resolution), detection of the signal (heat, differential detection), interpretation of spectrum (qualitative, mixtures, resolution), advantages of Fourier Transform (FTIR). Samples and results expected. Applications: Issues of quality assurance and quality control, Special problems for portable instrumentation and rapid detection.

UNIT – III

10h

UV-Visible/ Near IR – emission, absorption, fluorescence and photoacoustic. Excitation sources (lasers, time resolution), wavelength dispersion (gratings, prisms, interference filters, laser, placement of sample relative to dispersion, resolution), Detection of signal (photocells, photomultipliers, diode arrays, sensitivity and S/N), Single and Double Beam instruments, Interpretation (quantification, mixtures, absorption vs. fluorescence and the use of time, photoacoustic, fluorescent tags).

UNIT – IV

8h

Separation techniques

Chromatography: Gas chromatography, liquid chromatography, supercritical fluids, Importance of column technology (packing, capillaries), Separation based on increasing number of factors (volatility, solubility, interactions with stationary phase, size, electrical field), Detection: simple vs. specific (gas and liquid), Detection as a means of further analysis (use of tags and coupling to IR and MS), Electrophoresis (plates and capillary) and use with DNA analysis. 46 Immunoassays and DNA techniques

8h

Mass spectroscopy: Making the gaseous molecule into an ion (electron impact, chemical ionization), Making liquids and solids into ions (electrospray, electrical discharge, laser desorption, fast atom bombardment), Separation of ions on basis of mass to charge ratio, Magnetic, Time of flight, Electric quadrupole. Resolution, time and multiple separations, Detection and interpretation (how this is linked to excitation).

UNIT – V

10h

Elemental analysis:

Mass spectrometry (electrical discharges).

Atomic spectroscopy: Atomic absorption, Atomic emission, and Atomic fluorescence.

Excitation and getting sample into gas phase (flames, electrical discharges, plasmas), Wavelength separation and resolution (dependence on technique), Detection of radiation (simultaneous/scanning, signal noise), Interpretation (errors due to molecular and ionic

species, matrix effects, other interferences).

NMR spectroscopy: Principle, Instrumentation, Factors affecting chemical shift, Spin coupling, Applications. 4h

Electroanalytical Methods: Potentiometry & Voltammetry 4h

Radiochemical Methods 4h

X-ray analysis and electron spectroscopy (surface analysis)

Reference books:

1. Skoog, D.A. Holler F.J. & Nieman, T.A. Principles of Instrumental Analysis, Cengage Learning India Ed.
2. Willard, H.H., Merritt, L.L., Dean, J. & Settoe, F.A. Instrumental Methods of Analysis, 7th Ed. Wadsworth Publishing Company Ltd., Belmont, California, USA, 1988.
3. P.W. Atkins: Physical Chemistry.
4. G.W. Castellan: Physical Chemistry.
5. C.N. Banwell: Fundamentals of Molecular Spectroscopy.
6. Brian Smith: Infrared Spectral Interpretations: A Systematic Approach.
7. W.J. Moore: Physical Chemistry

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SRR & CVR GOVT. DEGREE COLLEGE (A) :: VIJAYAWADA
PAPER – VIII-B-2
INSTRUMENTAL METHODS OF ANALYSIS
Weightage of marks (Blue Print)

S.No	Name of the Topic	Essay Questions	Short Questions
1	Unit- 1 Introduction to spectroscopic methods of analysis	2	2
2	Unit- 2 Molecular spectroscopy Infrared spectroscopy	2	2
3	Unit- 3 UV-Visible/ Near IR	2	2
4	Unit- 4 Separation techniques	2	2
5	Unit- 5 Mass spectrometry	2	2
Total		10	10

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Cluster Elective –II

PAPER – VIII-B-3: ANALYSIS OF DRUGS, FOODS, DAIRY PRODUCTS & BIO-CHEMICAL ANALYSIS

45 hrs (3 h / w)

UNIT- I

Analysis of the following drugs and pharmaceuticals preparations:

(Knowledge of molecular formula, structure and analysis)

Analysis of analgesics and antipyretics like aspirin and paracetamol

Analysis of antimalarials like chloroquine .

Analysis of drugs in the treatment of infections and infestations :Amoxycillin., chloramphenicol, metronidazole, penicillin, tetracycline, cephalexin(cefalexin).

Anti tuberculous drug- isoniazid.

UNIT - II

Analysis of the following drugs and pharmaceuticals preparations:

(Knowledge of molecular formula, structure and analysis)

Analysis of antihistamine drugs and sedatives like: allegra, zyrtec(citirizine),

alprazolam, trazodone, lorazepam, ambien(zolpidem), diazepam.

UNIT - III

Analysis of anti epileptic and anti convulsant drugs like phenobarbital and phenacemide.

Analysis of drugs used in case of cardiovascular drugs: Atenolol,

Norvasc(amlodipine),

Analysis of lipitor(atorvastatin) a drug for the prevention of production of cholesterol.

Analysis of diuretics like: furosemide (Lasix), triamterene

Analysis of prevacid(lansoprazole) a drug used for the prevention of production of acids in stomach.

UNIT - IV

Analysis of Milk and milk products: Acidity, total solids, fat, total nitrogen, proteins,lactose, phosphate activity, casein, choride.

Analysis of food materials-

Preservatives: Sodium carbonate, sodium benzoate ,sorbic acid

Coloring materials, -

Briliant blue FCF, fast green FCF, tertrazine, erythrosine , sunset yellow FCF.

Flavoring agents - Vanilla , diacetyl, isoamyl acetate, limonene, ethylpropionate , allyl

hexanoate and Adulterants in rice and wheat, wheat flour, sago, coconut oil, coffee powder, tea powder, milk.

UNIT - V

Clinical analysis of blood:Composition of blood, clinical analysis, trace elements in the body. Estimation of blood chlolesterol, glucose, enzymes, RBC & WBC ,Blood gas analyser.

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REFERENCE BOOKS :

1. F.J. Welcher-Standard methods of analysis,
2. A.I. Vogel-A text book of quantitative Inorganic analysis-ELBS,
- 3 .F.D.Snell & F.M.Biffen-Commercial methods of analysis-D.B.Taraporavala & sons,
4. J.J.Elving and I.M.Kolthoff- Chemical analysis - A series of monographs on analytical chemistry and its applications -- Inter Science- Vol I to VII.,
5. Aanalytical Agricultrual Chemistry by S.L.Chopra & J.S.Kanwar -- Kalyani Publishers
6. Quantitative analysis of drugs in pharmaceutical formulations by P.D.Sethi, CBS Publishers and Distributors, New Delhi
7. G. Ingram- Methods of organic elemental micro analysis- Chapman and Hall.,
8. H. Wincciam and Bobbles (Henry J)- Instrumental methods of analysis of food Additives.
9. H.Edward-The Chemical analysis of foods; Practical treatise on the examination of food stuffs and the detection of adulterants,
10. The quantitative analysis of drugs- D.C.Garratt-Chapman & Hall.,
11. A text book of pharmaceutical analysis by K.A.Connors-Wiley-International.,
12. Comprehensive medicinal chemistry-Ed Corwin Hansch Vol 5,Pergamon Press.

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Cluster Elective –II
ORGANIC
PAPER – VIII-B-3: ANALYSIS OF DRUGS, FOODS, DAIRY
PRODUCTS & BIO-CHEMICAL ANALYSIS

BLUE PRINT

WEIGHTAGE OF MARKS

S. No	NAME OF THE TOPIC/UNIT	ESSAY QUESTIONS	SHORT ANSWER QUESTIONS
1	UNIT-I	2	2
2	UNIT-II	2	2
3	UNIT-III	2	2
4	UNIT-IV	2	2
5	UNIT-V	2	2

Unit 1
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